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ANCIENT INDIA



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NOTES

last issue of *Ancient India* dealt with an important phase of the transference of ...at took place on the 15th August, 1947, viz. the creation of the State of Pakistan. ...ernment Department cannot exist in utter divorcement from the political develop- ...in the country. No explanation is therefore needed to revert to one or two such ...ments in so far as they relate to Indian archaeology.

* * * * *

...irst, the Indian States. Historically these States were the survivals of the numerous ...l principalities that had sprung up in the turmoil following the break-up of the ...l Empire; they were not annexed by the East India Company and therefore never ... a part of 'British India'. 'Indian India', consisting of about five hundred and ...ates each headed by a hereditary ruler owing allegiance to the British Crown, occupied ... partition India an area of 588 hundred square miles and accounted for 88 million ...epresenting respectively about 48 p.c. and 27 p.c. of the total area and population ...w India.

...e peoples of the States had no separate historical or cultural traditions; nor did ...ographical positions correspond to any natural, linguistic or ethnic boundaries. ...ere historical accidents, they could not be regarded as separate cultural entities; ...aeological material contained in them was only an integral part of the larger ancient ... of India.

..., as the administration of the States ran independently of the Departments of the ...ment of India, the Archaeological Department of India had no jurisdiction over ...haeology of the States. A few of the larger and more advanced States had their ...chaeological departments of varying efficiency. Their contacts with the Central ...ment were cordial but infrequent. In the vast majority of States no archaeological ...tion or even a preliminary survey worth the name had taken place. Standing ...ents had been allowed to decay and even disappear.

... political map of India began to change quickly after the 15th August, 1947. With ...ppearance of the Paramount Power the rulers of the States became quickly aware ... anachronistic position in the midst of the centripetal forces operating in free India ...itarily co-operated with the processes of unification initiated by the Government ... In the course of a year, upwards of five hundred States were effaced altogether, ...erged in the neighbouring Provinces, or were integrated to form administrative ...ke the Provinces of the rest of India. Only some of the important States remain ...e units within the Union of India. Thus, instead of being confronted with the ...of having to deal with about five hundred and fifty States individually, we have, ...se Notes are being written, only to consider four categories into which they have ... classified:

1. More than twenty States which have been declared as Centrally-administered areas;
2. Upwards of two hundred States which have merged with the neighbouring Provinces;
3. About three hundred States which have formed into six different Unions or administrative units; and
4. Less than half a dozen States which remain unaffected by the merger or integration schemes and continue as viable units.

To these must be added a fifth category, consisting of less than a dozen States, the fate of which has yet to be decided.

Thus, while with the transference of power in 1947 a large portion of the archaeological material of India was transferred to the newly-created Dominion of Pakistan, what is left in the rest of India can now be marshalled together without political impediment. As archaeology is a Central subject and will in all likelihood remain so in the new Constitution that is being framed by the Constituent Assembly, the Department will have to take direct charge of the archaeology of the States coming under the first two categories enumerated above. The States of the third and fourth categories may create, or retain, their own archaeological departments but may as well voluntarily delegate their archaeology to the Centre. It is expected that a large number of States or Unions of States will take recourse to the latter arrangement or, at any rate, increasingly take advantage of the experience and resources of the Central Archaeological Department. In fact, we have already been requested by some States to take over their archaeology and direct it from the Centre.

These additions to the territorial jurisdiction of the Department will mean an expansion of its activities: new regions, some of them already known to contain prehistoric and protohistoric remains, will now be opened up for exploration; new problems of conservation to standing monuments, some of which have suffered heavily through age-long neglect, will have to be tackled. The details of administrative changes which all this will entail are no direct interest to the readers of *Ancient India*. Suffice it to say that an increase in exploration-staff will be required and a re-adjustment of its Circles will be necessary.

* * * * *

The draft of the new Constitution of India retains archaeology on the Union List, as a Central subject, the exact words used being 'Ancient and Historical Monuments decla by Parliament by law to be of national importance; archaeological sites and rem This implies that monuments not declared to be of national importance may, if the Pro like, be looked after by them. There are thousands of monuments all over India are only of regional importance, e.g. monuments connected with local poets and heroes or commemorating events of local interest. It is but proper that such monuments should partake of the care and patronage of the Provincial Governments.

Some Provinces have already declared their intention of starting their own archaeological departments. The growing interest in archaeology which this proposal evinces is matter to be encouraged, but care has at the same time to be taken that the initi enthusiasm does not outstep the limitations imposed by the paucity of technical equipme The Provinces can indeed do very valuable work in ground-survey and in listing of sites monuments, for with their network of local officers they can command greater fac for this type of work than the non-too-lavishly staffed Central Department. When lists are available it should not be difficult to sift out the monuments of national import from those of local significance. But in the greater field of archaeological explor

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ARCHAEOLOGICAL FIELDWORK IN INDIA: PLANNING AHEAD

By R. E. M. Wheeler

The following article by the ex-Director General of Archaeology in India, dealing with the principles which have guided the Department of Archaeology in its selection of sites for excavation during the last four years and which should, according to the writer, guide its future policy, was originally intended for circulation among the officers of the Department. As it contains matter of general interest, it is republished here for a wider public. It may be noted in retrospect that the results of the recent excavation at Śiśupālgarh (pp. 62 ff.), one of the sites figuring in his scheme, have justified the writer's expectations.

A. General principle

1. Like the fieldwork of another profession, archaeological fieldwork may be classified broadly in two aspects: the strategic and the tactical. By strategy is meant, in this context, the choice of the objective, the selection of the problem and of the sites or regions best calculated to solve that problem. By tactics is meant the detailed method of attacking the selected site or region. With the tactics of field-archaeology this memorandum is not further concerned: the subject has been touched upon in the 'technical section' of *Ancient India* and elsewhere. The following paragraphs deal with the over-riding question of strategy.

2. In a country so vast and containing so many ancient sites as India, careful planning on a large scale is essential if archaeological exploration is to produce coherent and significant results within any reasonable space of time. To dig a site merely because it 'looks good' or because it *might* produce useful information would be comparable to carrying out a surgical operation at random on a patient in the hope of finding somewhere the cause of an undiagnosed disease. It was thus that the primitive surgeon used to cut a hole in a man's skull in the hope of letting out a headache. It is thus that ancient sites—megalithic tombs, for example—have been constantly opened up in the hope of letting out their secrets. Not thus is the orderly way of science. True, a happy chance will from time to time a[...] unexpectedly and dramatically to knowledge. Nevertheless, the progress of scien[...] not on these hazards, but on the methodical, logical use of the discipl[...] in the evaluation of cause and effect. It depends upon careful strategi[...]

B. Planning, 1944–47

3. In the immense field offered by India many alternativ[...] equal value are necessarily feasible. During the past four years [...] ment has in fact initiated two parallel schemes, both of which h[...] success and deserve further development. They relate respecti[...] graphical divisions of the sub-continent: on the one hand to the [...] between the Vindhyas and the Himalayas, and on the other to the [...] strips of the South. No excuse is needed for this duality, reflecti[...] natural, linguistic and cultural divisions of the country, and, incic[...] partial co-operation with the nineteen universities which, from the [...] have almost without exception contributed through their senior stu[...] of the work.

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and excavation any large amount of decentralization will be a retrograde step. As my predecessor, Dr. R. E. M. Wheeler, points out below (pp. 4ff.) archaeological work must be planned to yield the best result and 'to ensure a methodical accumulation of knowledge by steady progression from known to half-known and unknown'. Once this is agreed to, it follows that the planning should be done on an all-India basis, in which the merged and acceded States are to have their due share, and it must therefore be the responsibility of the Central organization. Local patriotism is not be discounted but must be subordinated to the interests of science, and the paltry resources that are available for archaeological pursuits cannot be frittered away on diverse aims and for uncertain results.

* * * * *

A few apologetic words about *Ancient India*. The last three numbers were produced on a scale in no way in consonance with their sale-price. As it is not possible to set aside financial considerations altogether, we regret the necessity of having to shrink back this number almost to the original specification. The editor of the first number hoped that with the restoration of normal paper-supply and other services, *Ancient India* would appear twice yearly. Unfortunately, the difficulties in the way of the production of this type of work in peace-time have proved to be no less insuperable than in war-time, and keeping to the time-schedule still remains a thing to be hoped for.

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4. The two selected problems relate to obvious and primary gaps in our knowledge of the protohistory and early history of India. In the North the great hiatus between the end of the Indus Valley civilization, dated by Mesopotamian contacts in the third millennium B.C., and the absorption of North-west India into the historical Achaemenid empire of the sixth century B.C.—the hiatus which must have coincided with the formative period of modern India—is a standing challenge to Indian research. What was the material background of the Vedic hymns? What part if any did the Indus cities, representing one of the great civilizations of the ancient world, play in the formation of the Indian civilization of later ages? Of what sort were the Aryan invaders? Whence and when? These are questions in which the problems of India are integral with those of greater Asia, but they are also questions to which Indian scholarship may be expected to provide an important part of the answer. And further substantive advance is unlikely until Indian field-exploration, carefully planned and executed, provides fresh material evidence.

5. In the South, the archaeological problem is, in a sense, vaster still. There we have no dated contact with ancient Mesopotamia, and no intrusive Persian empire. Scraps of information approximating to an uncertain history begin in the time of Aśoka, but it was not until the Graeco-Roman geographers of the first and second centuries A.D. included Indian trade within their survey that the historical map assumed something approaching a coherent outline. Not indeed until the time of the Pallavas is South Indian history firmly established upon a basis of written record. For earlier periods, archaeology must dominate the field: but prior to 1944 archaeology had not shouldered this responsibility. A certain amount of excavation had been carried out; urn-fields, megalithic tombs and occasional town-sites had been dug into; but no firm chronological datum-line and no systematic culture-sequence had been established. Scientific field-archaeology in South India had not begun.

6. Here then were two outstanding archaeological problems which not merely invited but demanded attention. I will take them in turn, indicate our preliminary scheme of work and point to future needs.

7. In dealing with the 'Dark Age' of the Vedic period, the first requirement was to determine its delimiting phases with all possible exactitude. In other words, more information was needed on the one hand as to the date and circumstances of the end of the Indus civilization and on the other hand as to the cultural conditions of North-west India in the time of the Persian aggression at the end of the sixth century B.C. For the latter purpose, the oldest of the three successive sites of Taxila—the so-called Bhīr Mound—provided an obvious starting-point, since archaeology and history have combined to indicate that this city was already in existence for some considerable time before the arrival of Alexander the Great in 326 B.C. Moreover, Taxila, where Sir John Marshall had carried out excavations for more than twenty years, was better equipped than any other site in India for the collateral purpose of training in the technique of archaeological excavation. Accordingly, an organized training school was established here in October 1944, and for six months the Bhīr Mound was intensively explored. The work showed clearly that the occupation of the Bhīr Mound extended back towards, but scarcely beyond, the annexation of North-west India by the Persian empire. It at least defined the character of the terminal phase of the Vedic Dark Age. Apart from that, it adequately fulfilled its secondary purpose in initiating a considerable number of young Indian students and technicians into modern methods of field-research.

8. The next step in relation to this problem was taken in 1946, at the famous site of Harappā in the Punjab, where the Indus civilization had first been recognized in 1921. Here excavation had already shown the presence of a post-Indus-Valley culture overlying the Indus city, and here also, in 1944, had been detected a significant feature which had

hitherto escaped notice, namely, the presence of formidable fortifications. These fortifications were now proved by excavation, and their presence not only altered radically our interpretation of the sociological aspects of the Indus civilization but enabled us, with a fair measure of probability, to bring that civilization into direct relationship with the Āryan invasions reflected in the *Ṛigveda*.

9. In order to appreciate the historical significance of this new evidence, it is necessary to recall that in 1940 the Mesopotamian dating upon which that of the Indus valley is based had been drastically shortened by Mr. Sidney Smith, and that Sargon of Agade, in whose time Indus products were reaching Mesopotamia, was now shown to have lived nearer 2300 B.C. than 2500 B.C or earlier as previously believed. This and other evidence indicated a terminal date for the Indus civilization in the second rather than the third millennium B.C., *i.e.* in the millennium which is now generally believed to have seen the emergence of the Āryans in India. Without re-traversing published material in detail, it will suffice to summarize the new position as follows:—(i) the end of the Indus civilization and the arrival of the Āryans have now been brought to within short range of each other; (ii) the Indus cities are now known to have been heavily fortified; (iii) in the *Ṛigveda* the Āryans are constantly warring against the *fortified* cities of the native inhabitants; and (iv) if these fortified cities are not to be identified with those of the Indus Valley civilization, we have to assume that, in the very short interval which at the most can have intervened between the end of that civilization and the advent of the Āryans, a widespread and well-organized and fortified civilization of which nothing is known to us came suddenly into being. This assumption is untenable without supporting evidence. We may now reasonably suppose that the cities of the Indus Valley civilization are those which were destroyed by Indra and his Āryan following in early Vedic times.

10. Thus at Taxila on the one hand and at Harappā on the other, the excavations of 1944–46 gave a new definition to the two phases which 'bracket' our Dark Age. Particularly at Harappā, the new evidence is of cardinal importance from more than one standpoint. It remained, however, to fill up the blank millennium which intervened. What was the next step? What were its controlling factors?

11. Four main conditions controlled the choice of site for the further investigation of this problem. First, the selected site should be one of manifest importance if it was to produce clearly-defined evidence of the major issues. Secondly, it should lie within or near one of the natural gateways into India, on the assumption that the Āryan revolution was in fact an Āryan invasion. Thirdly, it should lie towards the north rather than towards the south of the Indus zone: for the pottery of the Indus civilization is basically of that red type which is characteristic of the northern rather than the southern Asiatic zone (see *Ancient India*, no. 1 (Jan., 1946), p. 9) and may safely be regarded as a geographical pointer. Fourthly, it should be a site which is known to have survived in its upper levels into the historic period and is at the same time likely to have its roots in the Indus civilization; it must present a reasonable probability of spanning the Vedic Dark Age.

12. Such a site is Bālā Hisār and the adjacent city-mounds at Chārsadā on the plain 20 miles north-east of Peshawar. The group is probably the finest of its kind in India (including, for this purpose, Pakistan). It lies squarely in the principal gateway of the north-west frontier. It stands at the northern end of the Indus plain. As Pushkalāvatī it was a capital-city until it was superseded by Peshawar itself under the Kushan régime in or about the second century A.D.; it had been occupied by Alexander's troops in 326 B.C.; its immense height—something like 100 feet—indicates accumulation over a long period of time; and, although no Indus valley element has yet been detected (or looked for) beneath

this canopy, the site is precisely such as appealed to the Indus builders, and an Indus origin may be regarded as a 'good risk'. Its occupation may at least be supposed to have extended backwards behind the Persian period into the latter part of our Dark Age. It is unrivalled as a potential focus for prehistoric and protohistoric research in the north-west.

13. Accordingly, it was intended that in 1947-48 Chārsadā should follow Harappā in the Department's programme of field-research. The partition of August 15th, 1947, frustrated the plan, and the pursuance of the problem now devolves upon the Archaeological Department of Pakistan.

14. Meanwhile, interleaved with the work described above, our second problem—the opening-up of South India—had received considerable attention. Reference has been made above to the impact of foreign trade upon the South during the early centuries of the Christian era. In the absence of reliable local record, this foreign trade seemed likely to provide a fixed point from which to initiate a systematic culture-sequence; and, in particular, the known occurrence of dated Roman coins in many parts of South India presented a useful context for the investigation of associated (but otherwise undated) Indian cultures. It was therefore one of my first acts as Director General to draw up a list of sites known to have produced Roman coinage, and to send one of my officers and my Excavations Assistant on a systematic tour of the listed sites with a view to selecting one of them for investigation. My envoys worked steadily down the west coast and round Cape Comorin without encountering any very hopeful sign. Fortunately, when deliberate search failed a happy chance intervened.

15. In July 1944 I visited the Government Museum at Madras and found in a cupboard there a part of an amphora (two-handled storage-vessel) of a type familiar in the Graeco-Roman world about the beginning of the Christian era. It had been dug up recently at a coastal site near Pondicherry, the capital of French India, some 80 miles south of Madras. By arrangement with the French authorities, I visited Pondicherry and saw in the Public Library there a collection of objects which had been recovered during the previous two or three years by French antiquaries at a site known locally as Arikamedu, 2 miles south of the town. The collection comprised a considerable quantity of Indian pottery, beads and other objects, together with a remarkable assemblage of material of Mediterranean origin, including many sherds of amphorae, fragments of glassware, part of a lamp, and an untrimmed crystal intaglio representing Cupid with an eagle. More important than these, however, were several sherds of a distinctive red-glazed ware made at Arretium and other Italian centres prior to *c.* A.D. 45 and known collectively as 'Arretine ware'. Here indeed was the end of our search; for dated pottery, by virtue of its relatively limited durability, was better evidence even than dated coins, of which the survival factor is often difficult to compute. It remained to ascertain, by careful digging, the precise relationship between this dated Arretine ware and the Indian culture found on the same site.

16. The subsequent (1945) Departmental excavations at Arikamedu have been fully recorded in *Ancient India*, no. 2. It will suffice here to note that the site will go down in the history of South Indian archaeology as that from which the archaeological classification of ancient South Indian cultures effectively began. With the aid of the dated imports to which I have referred, it defined for the first time the chronological position of an extensive complex of South Indian pottery and other equipment dating from the first two centuries A.D.: and it was not long after the conclusion of the work that the importance of Arikamedu was found to extend far beyond the vicinity of the site itself.

17. Amongst the distinctive products of Arikamedu was a type of dish decorated on the internal base with concentric rings of a rouletted pattern, otherwise foreign to Indian ceramic and manifestly derived from a characteristic feature of the Arretine ware with which it was associated. Search in the museums of the Deccan and South India showed

that this rouletted ware had been found also at Amarāvatī in the Guntur district, at Māski and Koṇḍāpur in the Nizam's Dominions, and at Chandravalli and Brahmagiri in the Chitaldrug district of northern Mysore. At Māski, Koṇḍāpur and Chandravalli it was derived from settlements ascribed in part to the Āndhra period, and at Chandravalli Roman coins of the first century A.D. had also been found. This further evidence was therefore potentially consistent with the Arikamedu dating. At all these sites the newly dated rouletted ware introduced at once an element of chronological precision; and on all of them it was associated with a ceramic industry differing largely from that of Arikamedu and marked notably by a russet-coloured pottery decorated with yellow rectilinear patterns. Already the fixed-point of Arikamedu had helped to fix also the dating of a widespread culture in the Deccan.

18. A visit to the Brahmagiri site in 1945 revealed other and wider possibilities. Trial-excavations carried out by the Mysore State Archaeological Department at the foot of the hill in the vicinity of the Brahmagiri Aśokan rock-edict had revealed remains of an extensive ancient township, doubtless the Isila of the edict. Adjoining the town-site was a large cemetery of megalithic tombs of a kind widespread in Peninsular India but never adequately dated. Further, the Brahmagiri cists possessed the circular entrance-opening which is present on many other Indian examples and on similar tombs in western Asia, northern Africa and Europe, and may indicate a common origin for the whole of this widespread series. In any case, here was an opportunity for the first time of equating the culture represented by these tombs with an adjacent stratified town-site containing a known factor—the dated rouletted ware It remained to ascertain the precise nature of this equation by scientific digging.

19. Accordingly, in 1947, with the ready co-operation of Mysore State, a simultaneous exploration was carried out on the Brahmagiri town-site and in the adjacent megalithic cemetery. The former revealed three successive cultures, of which the uppermost was associated from the outset with rouletted ware of the first century A.D. and included an abundance of the yellow-painted ware referred to above in paragraph 17. Below this culture, to which the name 'Āndhra' may now safely be given, and partially overlapping it, was a culture identical with that which was being revealed at the same time in the megalithic cists. This 'megalithic' culture included a liberal equipment of iron weapons and tools in association with a distinctive ceramic, polished and turned on the slow wheel and commonly parti-coloured in black and brown as the result of differential kiln-action. The stratigraphical position of this culture in relation to the overlying 'Āndhra' culture indicated that it lasted into the first half of the first century A.D. Thus, for the first time a fixed chronological point was obtained for a group of megalithic tombs of a kind which constitutes the most abundant class of 'ancient monuments' in Peninsular India.

20. But this was not all. A reasonable computation of the time-value of the megalithic strata at Brahmagiri suggested *c.* 200 B.C. as an initial date for the arrival of this culture in the region. Below that was an accumulation of about 8 feet of occupation-material representing an altogether different and more primitive culture. This earlier culture was marked by the use of polished stone axes, microliths or small implements of quartz and semi-precious stones, rough hand-made pottery, and occasional small objects of copper and bronze; iron and the potter's wheel were alike unknown. Here was the first evidence of something approaching a Bronze Age in the South, although stone was the dominant material. Above all, the discovery for the first time placed in a chronological context a group of objects which (particularly the stone axes) had been widely recognized from scattered surface-finds in central and southern India but had never been related to a culture-sequence. A clear overlap with the succeeding megalithic culture showed that this

'stone-axe' culture had lasted until after 200 B.C., and the depth of the accumulated strata indicated its arrival at Brahmagiri some time in the first half of the first millennium B.C.

21. Other inferences followed. In particular, there was no sort of cultural transition between the primitive 'stone-axe' culture and the evolved megalithic culture which overlay it. The latter represented a sudden intrusion from elsewhere, a circumstance which raises major problems outside the scope of the present memorandum. A preliminary discussion has been included in the report published in *Ancient India*, no. 4.

22. The Brahmagiri excavations had thus not merely furnished the evidence which was their primary objective but had in fact placed no fewer than three widespread but hitherto unclassified South Indian cultures in a clear sequence, with a chronological datum-line at one end of the sequence. So important was it to establish this datum-line beyond all shadow of doubt that a small parallel excavation was carried out at Chandravalli, in the outskirts of Chitaldrug itself, where the Mysore Archaeological Department had previously found remains of an Āndhra city, with characteristic yellow-painted pottery, scraps of the rouletted ware to which Arikamedu had now given a special importance, a large number of Sātavāhana potin coins, and four or five Roman denarii of the first half of the first century A.D. It was evident that in the Āndhra period Chandravalli had been a richer site than Brahmagiri (Isila), and was more likely to represent the full range of the contemporary culture. The full report need not be anticipated here, except to remark that the Chandravalli evidence amply confirmed the dating of the Brahmagiri Āndhra culture and, amongst many additional Āndhra coins, yielded a further Roman denarius dated A.D. 26–37.

C. Future planning

23. Thus far to 1947. Turning to the future, I propose to retain the dual geographical basis, whereby the North and the South are for the time-being considered separately, and will deal first with future work in the South.

24. The Brahmagiri excavations have already extended the Arikamedu results 300 miles northwards into the heart of the Deccan plateau. There they link up with (unpublished) work carried out by the Hyderabad State Archaeological Department at Kondāpur, Māski and elsewhere in the Nizam's Dominions. At the two named sites have been found the remains of Āndhra cities possessing a culture essentially similar to that of Brahmagiri and Chandravalli. Further work in that region must be left to the State authorities, but along both flanks we can carry our results progressively further north, with a view ultimately to debouching upon the Northern Plains and so linking up the two geographical divisions of our work.

25. With this objective in mind, preliminary ground-survey already indicates certain clear lines of advance. On the eastern side, the finding both of rouletted and of Āndhra painted sherds on the site of the famous Āndhra capital of Amarāvatī, in the Guntur district, points the need—on this as on other grounds—of ascertaining the culture-sequence at this site. Here again the alleged discovery of Roman coins holds out the possibility of precisely dated collateral evidence; and the known presence of an urn-field, representing a non-Āndhra culture, offers further potentialities of an important kind. Having systematized Amarāvatī our next step on this side is to find another major town-site which may be expected to carry our evidence northwards. Here I commend the site of Śiśupālgarh, at Bhuvanesvar in Orissa—possibly the ancient Tosali of the Kaliṅgas, and certainly a site of outstanding importance. Its considerable distance (over 400 miles) from Amarāvatī may be offset against the ease of coastal intercommunication, and I confidently anticipate

recognizable cultural links between the two sites. The proposed eastern sequence, then, is: first, Amarāvatī; secondly, Śiśupālgarh.

26. Meanwhile a similar northward progress can be foreseen on the western side, in the southern part of Bombay Province. Here a number of sites, notably Herakal, 5 miles north of Bagalkoṭ, and the imposing Brahmapuri mound at Kolhāpur, have produced Āndhra painted ware; whilst at the latter site a very remarkable (unpublished) collection of bronze objects, including a Graeco-Roman statuette—another useful chronological contact—has been discovered in the remains of an Āndhra building. Either of these sites, situated as they are 150–200 miles north-west of Brahmagiri, would carry our evidence northwards a very useful stage. No doubt in each case new cultural elements will be discovered alongside familiar elements from the South. These new elements will not only extend our general knowledge of Indian achievement but will provide fresh stepping-stones to a new knowledge of other cultures which we may in due course expect to relate to them both in time and place.

27. It should be emphasized that the programme outlined above is dominated by our present main need: that of *systematizing* the protohistoric and early historic cultures of India. Until we have some orderly knowledge of culture-sequences, the detailed investigation of particular cultures is premature. Our first requirement is a *grammar* of Indian archaeology, or, as I have stated in *Ancient India*, no. 3, pp. 143ff., a cultural time-table: until we know more than we know at present of the structure and succession of Indian cultures, of their distribution and interrelationship, the prolonged and detailed exploration of particular sites must wait. But it must not wait too long. Ultimately, it is the detailed excavation of an ancient town that alone can give us that information which is necessary to re-create a past civilization and to establish its significance in the general story of human progress. Detailed 'horizontal' excavation must be our ultimate goal; meanwhile, extensive 'vertical' excavations are the essential preliminary.

28. Parallel with our methodical advance up the Deccan, an important task awaits us on the Northern Plains. If for the moment we defer the further exploration of the great protohistoric cities of the Plains, such as Rājgir, Vaiśālī or Kauśāmbī, until our systematic progress from the South brings us nearer to them, we still have before us an objective which may in the fulness of time open up new historic and prehistoric vistas of the first importance. The recent partition has robbed us of the Indus valley and its famous prehistoric problems. We now therefore have no excuse for deferring longer the overdue exploration of the Ganges valley. After all, if the Indus gave India a name, it may almost be said that the Ganges gave India a faith, and is at least as worthy as her sister of our solicitude. The initial step must be that of ground-survey, carried out systematically and published methodically with careful maps. The survey should, I suggest, begin at Allahabad where, at the confluence, the great mound of Jhūsi offers an inspiring start, and should be continued steadily upwards into the foot-hills of the Himalayas, including a strip some 5 miles broad on each side of the present course of the river. During this survey, an occasional trench, carefully dug, may be found desirable, but for the most part the work will have to be restricted to actual survey and the collection of surface-finds—otherwise, no measurable progress will be possible. When the potentialities of the valley are better known, selective excavation will appropriately follow. Meanwhile, the survey, properly carried out, will itself occupy some years.

29. This then is the dual programme which I bequeath to the Department. It is designed to eliminate, so far as is humanly possible, any preponderance of accident, and to ensure a methodical accumulation of knowledge by steady progression from known to part-known and unknown. It is to be expected that, as at Brahmagiri, the pursuance of a

main objective will result incidentally in the discovery of side-issues, some of which may be of considerable importance. These will enhance the interest of the work and may indeed develop into new major issues, but do not themselves, of course, justify fortuitous digging. A well-thought-out plan is generally exempt from the disadvantages, but not the advantages, of chance. It wins both ways.

30. Two more points in conclusion. First, in order to encompass a maximum amount of training and experience in the short term of my Director-Generalship, the pace has been forced since 1945 without much reference to season or other factors. The way was long and the time was short. But normally, digging in the hot weather is not desirable, particularly on the Plains, where fatigue usually becomes uneconomic in May and June. I do not therefore regard recent practice as a precedent in this respect. On the other hand, on a water-logged site such as Arikamedu or Pāṭaliputra the rigours of the hot season have to be faced, since the encroaching water-table is then at its lowest. Secondly, a conditioning factor in the execution of a programme such as that outlined above is the *absolute necessity for completing the written report of one season's work before resuming field-work in the next.* If need be, a whole season's digging must be postponed to enable this essential task to be accomplished. Unrecorded excavation is destruction, and prompt and full publication must be regarded by the excavator as a point of honour. If he once allows his reporting to fall into arrears, the situation rapidly out-runs his control, and unfortunately the resultant loss is not to himself or his department but to science. Complete and punctual publication must be the invariable rule; no excuse whatsoever can condone deferment.

FURTHER EXPLORATION IN SIND: 1938

By KRISHNA DEVA *and* DONALD E. MCCOWN

The late Mr. N. G. Majumdar put on the archaeological map of India a large number of chalcolithic sites in Sind including the well-known type-site Amrī in course of exploratory surveys carried out during the years 1927-28, 1929-30 and 1930-31. His last expedition in the western hill-tracts of Sind in 1938, though it was short and ill-fated involving his tragic death, resulted in the important discovery of half-a-dozen new sites, of which Rohel-jo-kunḍ is remarkable as a settlement predominantly of Nāl culture with unmistakable Amrī contacts. The material from this expedition is published and interpreted by the authors, one of whom was attached to the expedition.

THE main aim of the late Mr. N. G. Majumdar in resuming his exploratory activities in Sind in October 1938, after a lapse of seven years, was to trace prehistoric remains and settlements along the foothills of the Khirthār range, which, being the western boundary of the middle portion of the Indus valley, was designed to play an important rôle from the earliest times. The results of his previous expeditions having shown the comparative paucity of early sites in the alluvial plains along the Indus, he had undertaken in 1930-31 a thorough exploration of the hill-tracts of Kohistān, Sehwān and the southern portion of the Johi *tāluka* as far as Pānḍi Wāhī in the north,[1] bringing to light a long chain of closely-situated settlements, dating from the end of the third millennium B.C. and earlier, in the valleys and on the spurs of the Laki, Bado and Bhit hills. Consequently, when the programme of exploration was revived in 1938, he picked up the thread where he had left it seven years before, and with his characteristic enthusiasm and thoroughness set upon the task of carrying his investigations further northwards in the Johi *tāluka* among the hills of the Khirthār range and in the adjoining highlands and plains. That he exercised great forethought in planning his programme is revealed by the excellent results achieved in exploring half-a-dozen early sites (fig. 1) in the short space of three weeks. What is more, he was on the track of important discoveries in the region of Rohel-jo-kunḍ, when he was shot dead and some of his assistants injured by dacoits. It is sad that the explorer did not live to write an account of these explorations, to which he alone could have done justice.

Leaving Delhi on the 17th October, 1938, the party reached Johi, the headquarters of the *tāluka* of the same name, in Dādu District on the 21st. Five days were spent at Johi in making suitable arrangements for riding and pack camels. All available information was at the same time collected from local officials and others about mounds and deserted ruins and about suitable halting places in the course of the exploratory journey through the north-western portion of the *tāluka*. The arrangements being completed, the expedition left on the 27th morning for Drigh Mathin, which is a fairly large village situated 14 miles north-west of Johi. After a three-hour ride across sandy countryside, with little vegetation except green patches of cultivation along the Johi canal, the first halt was

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[1] N. G. Majumdar, 'Explorations in Sind', *Memoirs of Archaeological Survey of India*, no. 48 (Delhi, 1934). The reader will find a useful summary of cultures mentioned in this article in Stuart Piggott, 'The Chronology of Prehistoric North-west India', *Ancient India*, no. 1 (1946), pp. 8–26. Abbreviations used for the references are: *MASI.—Memoirs of the Archaeological Survey of India*, *ARASI.—Annual Report of the Archaeological Survey of India.*


NAL
SUKKUR
R. INDUS
MOHENJO-DARO
R. GAJ
ROHEL-JO-KUND
JARE-JO-KALAT
CHHUTI-JO-KUND
RAJO-DERO
LOHUMJO-DARO
NAZGANI-JO-KUND
PAI-JO-KOTIRO
DADU
PANDI-WAHI
JOHI
ALIMURAD
LOHRI
GHAZI SHAH
NAWABSHAH
DAMB BUTHI
AMRI
CHANHU-DARO
KARACHI
ARABIAN SEA
NEW PREHISTORIC SITES IN SIND
NEWLY EXPLORED SITES
KNOWN SITES
MODERN TOWNS
HEIGHTS ABOVE 2000 FT
SCALE OF MILES
10 0 20 40 60

FIG. 1

made at the fortified Kutchery of a *Waderā*, i.e. Sindhi landlord. From here several places where old ruins were reported were visited, including a hill-spring in the valley of the Taki Nāi between the lower ridges of the Khirthār. But as only one prehistoric site, which could more conveniently be examined from the next stage, was encountered, the party moved on the 1st November to the Nāi Gāj Canal Bungalow, 10 miles north-west of Drigh. This journey lay through a tract of waste land, scoured by numerous torrent-beds which receive water only during rains in the hills and dry up afterwards. After traversing this bleak and barren area it was indeed a relief to reach the Nāi Gāj stream with its clear drinking-water.

Just where the Nāi Gāj debouches from the Khirthār hills into the plains, a fairly large masonry dam has been constructed across the river-bed to store and divert water into irrigation-channels. There is, nevertheless, only limited cultivation in the neighbourhood. Close to the dam, on an eminence, stands the Nāi Gāj Canal Bungalow, commanding a view of the hills on the west and the barren plains on the other sides. Immediately to the west of the bungalow, on a rocky ledge, were picked up some waste flakes together with a couple of worked flint blades which showed that the spot had been a small flint-knapping station in the past. This is not surprising in view of the important geographical situation of the place at the head of the Nāi Gāj valley. It is also worth noting that along the meandering course of the Nāi Gāj lies a route through the hills which is still frequented by the Brāhuis and Baluchis in crossing the Khirthār from the Kalāt territory into Sind. We shall have occasion to refer to this route below (p. 16).

1. PĀI-JO-KOṬĪRO

From the Nāi Gāj Bungalow, the ruins at a place called Pāi-jo-koṭīro (fig. 1), about five miles to the south-east in the plains below, were visited. This tract was completely barren and uninhabited, the nearest hamlet being a mile to the south. Being in the midst of a torrent-bed, the site had been nearly completely denuded, and all that remained was a mound measuring 25 feet square with a maximum height of 10 feet above the level of the sandy bed. The slopes of the mound and the surrounding area were strewn with plain and painted potsherds, pottery bangles and clay cake-fragments, the affinities of which with known objects left no doubt as to the site being a prehistoric one.

Trial-excavation was done on the site on the 4th and 5th of November. Three trenches were made, the first at the base of the mound, the second on the slopes and the third on the top. These trenches, which were carried to a depth of 4-5 feet, yielded very nearly the same kind of finds, consisting of a large number of plain and some painted and incised potsherds, terracotta bangles, cakes, toy-cart frames, shell bangles, perforated potsherds, a couple of flints, and a terracotta bull-figurine. These objects were recovered from loose débris of greyish clay which originally might have constituted the ruins of *kuchcha* houses, now weathered and pulverized beyond recognition through centuries of river- and wind-erosion. The majority of the painted sherds belonged to the black-on-red variety, characteristic of the Harappā civilization. But a few examples were also found of the thin, pale ware of the Amrī class, bearing decoration in chocolate on a cream or buff surface. The latter class of pottery was mostly found in Trench 1 at a depth of 4-5 feet in association with the thicker black-on-red ware. So far as this feature is concerned, the site bears analogy to Ghāzī Shāh and Pāṇḍi Wāhī, previously explored by Majumdar, though the preponderance of objects of the Harappā class marks Pāi-jo-koṭīro mainly as a station of the Harappā civilization.

The few examples of Amrian pottery are in the typical ware of tan shades (for the colour-terminology used, see below, p. 17) and are usually buff-slipped, though occasionally plain. When they are decorated, the paint used is brown. PK-13 (pl. I, 4),

the rim of a steep-sided small bowl, shows a panel-filling known from many Amrian sites.[1] A small pot (fig. 2, IV) [PK-3] duplicates the design of pl. III, 39 [RK-135], though it has a red-brown band between the suspended loop-pattern and the rim-line. Another small fragment bears the design of pl. III, 34 [RK-171]. PK-35 (pl. I, 9) is the base of a small cup or saucer with an irregular design inside. The unusually shallow bowl of pl. I, 1 (=fig. 2, VII) [PK-5], in buff-slipped, beige ware, bears a new Amrian design which is painted in brown with the oblique veins of the leaves in red-brown paint. In addition, there are several buff-slipped pot-fragments, varying from the form of fig. 3, XVII [RK-186] to that of fig. 2, III [PK-4], with rim-diameters of around 2·4 inches.

The remainder of the finds are Harappan. A few of the sherds are red-slipped and rarely burnished, but most of them are plain-surfaced with ware which is closer to beige and tan shades of buff than to light red or tan. Four red-slipped jar-sherds (pl. I, 3 and 5) [PK-19, 40] bear designs, of which three are foliage-patterns, while a bowl (pl. I, 2; fig. 2, VI) [PK-39] has a double wavy line design inside. The rest of the pottery is unpainted or with painted lines only. There are four fragments of large bowls with modelled rims (fig. 2, II, V, VI, VIII) [PK-1, 20, 39, 41].[2] Only one jar-rim was found (fig. 2, I)

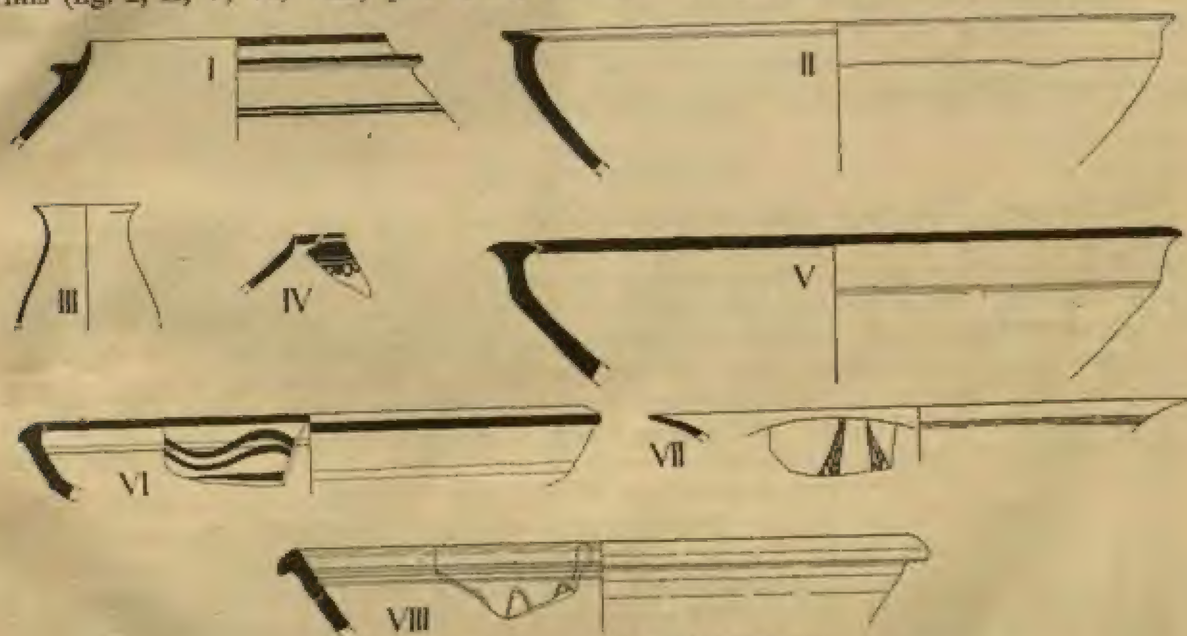


FIG. 2. *Pottery from Pāi-jo-koṭiro.* ¼

[PK-29], with a thin, reddish-toned brown wash (probably over a buff slip) outside down to the top of a pair of lines at the lower edge of the fragment. There are a few pieces of small, thin pots of the form of pl. VI, 65 (=fig. 5, XIX) [JK-19] with usually polished,

[1] For an example, see *MASI.*, 48, pl. XXIX, 12, from Bandhni.

[2] PK-1 is in ware an orange shade of tan with fairly common small brown grits; plain, with unsmoothed surface below the carination outside. PK-20 is of buff ware with some small red-brown grits. It is plain outside with a rough surface below the carination and a brown wash covering the interior and the rim. PK-39 is of orangey-tan ware with a red-brown wash inside and 1·16 inches below the rim outside and a dark-brown painted design inside. PK-41 is of beige ware with a buff slip inside and out and an incised wavy line below three incised horizontal lines inside.

red-brown slips and groups of horizontal, narrow lines. The pot shown on pl. VI, 65 (also fig. 5, XIX) [JK-19] is represented here by four sherds with brown to reddish-brown burnished slips outside above lines on the shoulders and buff slips below. Another series of small pots are in ware coloured beige to buff-tan shades, all with occasional to very common, small to medium red-brown grits, and either plain or with a buff slip outside. They are fairly thick (·2–·4 inch) with rim-diameters ranging from 4 to 7 inches. They are characterized by a rough, unsmoothed surface outside below the shoulder, or a combination of this with incised wavy lines on the neck and small shoulder (pl. I, 6 and 8) [PK-27, 16].[1] In addition, there are three plate-stands with incised patterns in the centre of the interior. PK-8 (pl. I, 10) is a low-footed form with radiating dot-lines. The other two examples have the common incised crescent pattern and the same, but incised over concentric circular lines. Fragments of perforated vessels were also found.

Other objects discovered were plain, buff clay bangles with diameters of 2–4·5 inches and circular cross-sections ·26–·51 inch thick. One fragment, flat on top and bottom, is decorated with red-brown blobs on the outer edge. Two fragments of toy-cart frames were also found.

Pāi-jo-koṭīro is, thus, a predominantly Harappan site. There is no doubt that the original settlement was of larger extent than the surviving area of denuded ruins. But the absence of any indications of the use of stone or burnt brick as building material serves to show that the settlement was a village consisting of *kuchcha* dwellings.

2. Rohel-jo-kunḍ.

While these soundings were being conducted, men were sent to bring specimens of pottery from a number of sites reported in the vicinity. Particularly impressive pottery-specimens came from Rohel-jo-kunḍ site (fig. 1), which was reported to be in the hills higher up the Nāi Gāj. After finishing the operations at Pāi-jo-koṭīro, it was decided to examine the site of Rohel-jo-kunḍ, and on the 7th morning the camp was moved from the Canal Bungalow along the westward route through the hills. A five-and-a-half mile ride partly along the Nāi Gāj stream, twice or thrice across its bed, and partly across a few ridges, brought us to Rohel-jo-kunḍ. By *kunḍ* in Sindhi is meant a 'corner', and the place is so called because of the sharp turn, at an angle of nearly 90°, taken by the Nāi Gāj here. Along the left bank of the stream stands an 80 feet high and mile-long escarpment with a steep, precipitous side towards the stream which is unusually deep here. But for a sloping talus of fallen stones it would have been extremely difficult to ascend the escarpment. At the top an unexpected vista presented itself. The surface spread out before the eyes as a fairly extensive table-land, nearly three quarters of a mile long by a quarter wide. Small portions of the table-land were occupied, here and there, by modern graves and the rest was covered with small, reddish shingle. Towards the western extremity, patches of painted potsherds of the Amrī type were visible on the surface, together with a few waste flint-chips and a worked blade. It was thus evident that the site had been a prehistoric settlement.

The prevalence of the pale ware with bichrome decoration, the total absence of the black-on-red ware on the surface, and the situation of the site on the bank of a perennial hill-stream along a route which, as now, must have been in use in antiquity, invested this site with special importance, and it was decided to do some trial-digging here. With the scanty supply of labour available it was possible to sink only two trenches at selected spots on the 9th and 10th November. In one of the trenches wall-fragments, consisting of two

[1] PK-16 is slipped inside, but outside down over part of the incised area only.

courses of water-worn boulders and being the foundations of two or three small chambers, were encountered. The foundations rested on the solid rock, which was uniformly met with 1½–2 feet below the surface. That these foundations pertained to prehistoric dwellings was clear from the associated find of numerous plain and painted potsherds. The superstructure of the dwellings seems to have been made of some perishable material such as mud. In the other trench, near the edge of the tableland overlooking the stream, no structural remains appeared, though the yield of potsherds, both plain and painted, was again abundant. The finds also included three well-worked flint blades, two of them with secondary flakings. It is significant that not a single object of the Harappā type was found here, and that there was not one specimen of black-on-red ware among the very large amount of pottery excavated.

The pottery-sample now available for study comprises 118 sherds. These are sufficiently alike as regards ware and surface-treatment to be considered one fabric. The pottery is wheel-made and the ware is fine, as far as a megascopic inspection permits us to say.[1] The colour of the fired clay ranges from beige to various shades of red-brown. These tones vary as they are more red, or orange or brown, and are usually of a light, rather than dark, colour. Most of the ware is of these red-brown shades, hereafter called tan for the sake of brevity, but there are a few examples of brown, without the reddish cast, and but two which can be called buff. In general, the clay has fired an even colour throughout, but control of firing was not perfect. There are four cases of grey or blackish ware and fourteen in which there is a difference in colour in the thickness of the body. In these either the core and edges of the wall, or the inner and outer halves, are brown or grey or tan of lighter and darker colour. The reader need not be unduly concerned with the various terms used to describe the colours of the ware. The significant fact is that, though the ware of most Amrian and Nāl pottery is of light-reddish shades, the surface-colour (frequently produced by a slip) is usually of buff, rather than reddish, tones. Some of the sherds show signs of a certain amount of work on the surface, presumably after the vessels were removed from the wheel. This is usually noticeable only in somewhat oblique smoothing marks on the interiors, but in three cases, all on painted vessels (fig. 3, XI, I; pl. III, 30) [RK-16, 43], the body was scraped outside horizontally leaving vertical ripples in the probably already somewhat dry clay.

On 77 sherds the exterior is covered with a buff slip which occasionally is rather thin. Eight of these also show the slip inside. Overfired vessels may have slips which are rather greyish or drab. Nineteen sherds are of plain-surfaced tan ware and include at least four with Nāl type designs. In addition there are a few plain reddish buff, brown and beige sherds. Besides the buff slip, a dark brown, brown-black, or reddish-brown slip (probably the same as the paint used) in eighteen cases is found covering the surface of certain bowls of the types seen on fig. 3, VII, III, VI [RK-46, 89, 105]. On eight it covers both interior and exterior, where it is sometimes rather smeary and reddish-brown. Of these, two have simple lines drawn inside and one (pl. II, 24) [RK-140] a repeated hook-pattern. In six cases the interior is brown-slipped while the outside is buff-slipped. Three of these are painted with designs (see pls. II, 22 and III, 41) [RK-152, 93]. RK-43 (pl. III, 30) is unique, with a brown slip inside and traces of it below a buff-slipped design zone on the exterior. There are also three undecorated cups (one, fig. 3, VIII) [RK-67], with a brown slip only on the outside. In only two cases is a slip or wash of really reddish colour found, RK-138 (fig. 3, V) where it is orangey-red (but probably within the range of the brown

[1] There are only a few cases of the use of temper. Two of these are sherds of the usual painted type with the designs of pl. III, 34 and 37 (RK-171, 124/125). These and RK-138 (fig. 3, V) all have occasional fine black grits. RK-139 (fig. 4, XXVII) has fairly common, medium to large, black grits.

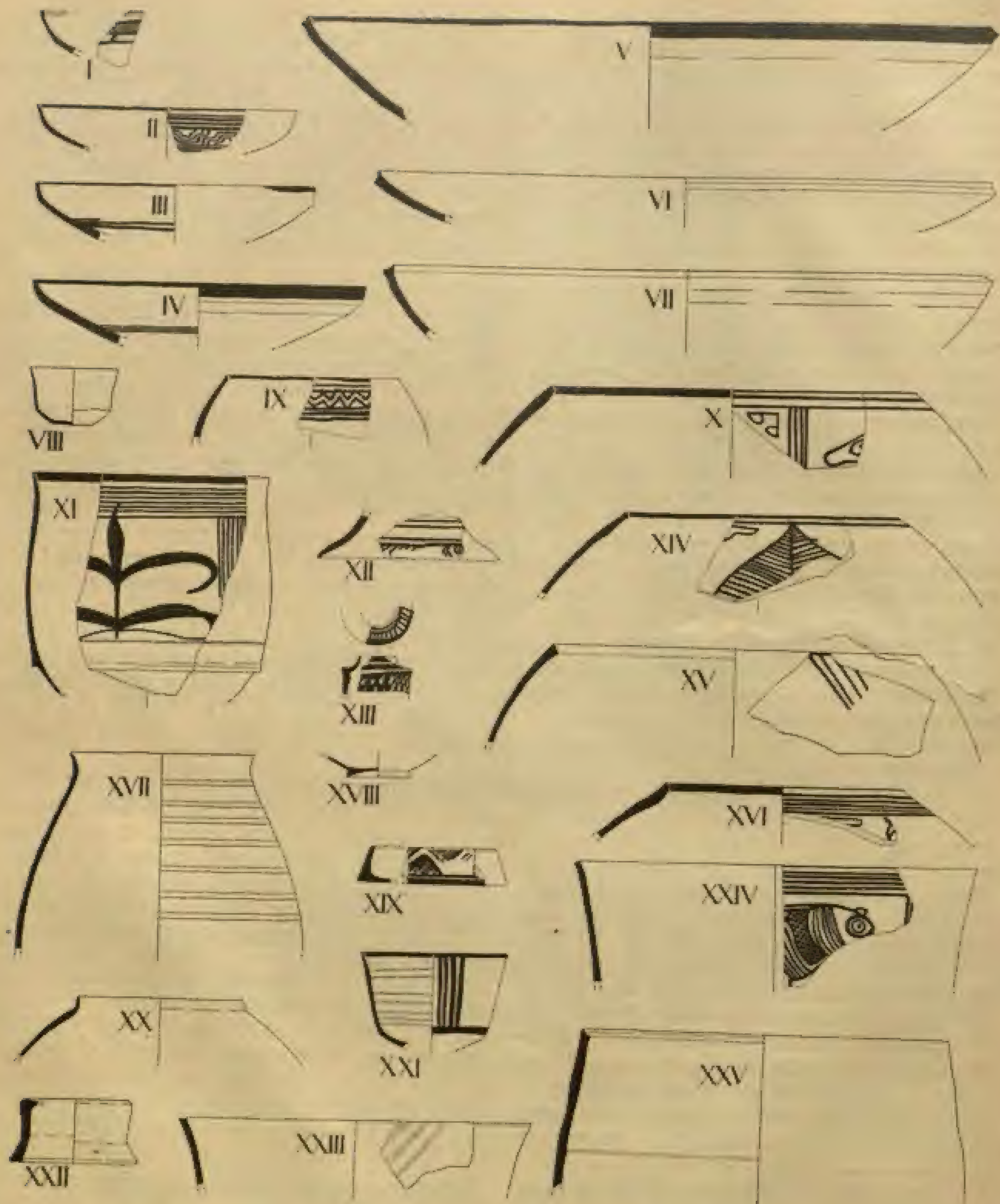


FIG. 3. *Pottery from Rohel-jo-kund.* ¼

to red-brown slips), and RK-110 (fig. 4, XXVI) where there is a reddish wash inside and probably traces of a buff slip out. RK-7 (fig. 3, XXV) is unique in having a buff slip outside over which is a smeary brown to light red-brown wash.

The number of vessel-forms is not particularly large. There is one type of hole-mouth jar, with probably a rather globular body and fairly thin walls ranging in maximum thickness[1] from ·2–·36 inch. There seem to be two different sizes with rim-diameters with ranges of 6–8 and 10-11 inches. The main variation in their form is found in the obliquity of the side and the treatment of the rim, both features being illustrated on fig. 3, XV, XVI, XIV, X [RK-81, 121, 122, 149]. Pl. III, 43 (also fig. 3, IX) [RK-182] shows an exceptionally small example of this type of vessel, while RK-7 (fig. 3, XXV) is unusually steep-sided.

The presence of a few sherds indicates the use of pots of the type of fig. 3, XX [RK-17], as well as good-sized, decorated beakers (fig. 3, XI) [RK-16] with a ledge low down on the body, rim-diameters from 5·5–6·5 inches and thickness of ·13–·19 inch.

Bowls of various types seem to have been the commonest form of vessel. Four types may be distinguished: (*a*) Large bowls with nearly vertical sides and tapering rims with diameters from 9–11 inches. Unusual, squared-off rims are shown on fig. 3, XXIII, XXIV [RK-87, 120]. (*b*) There are also smaller bowls, with rim-diameters of 4–5·5 inches, rather vertical, slightly everted sides and tapering rims, represented by RK-13,[2] (fig. 3, XXI) whose slight carination is not exceptional. This type of bowl occasionally occurs with rim-diameters as low as 3·5 inches. Its usual thickness is ·16 inch. (*c*) Shallower bowls in the forms shown on fig. 3, IV, III, I [RK-45, 89, 43] have rim-diameters of 7–9·5 inches and vary in thickness from ·2–·28 inch. These generally are covered with brown or brown and buff slips. (*d*) There are also a few examples of large bowls with slightly modelled rims and brown slips or washes illustrated on fig. 3, VI, V, VII [RK-105, 138, 46].

A few unusual forms may also be noted. Fig. 3, XIII [RK-50] shows a fragment from a miniature canister. Fig. 3, XXII [RK-77] illustrates probably a pot-stand with buff slip outside. RK-67 (fig. 3, VIII) is a miniature cup with a brown slip or wash outside and on the base. RK-113 (fig. 3, XVIII) represents the only ring-base discovered; it shows traces of a buff slip on the outside and base. RK-100 (fig. 3, XIX), of plain, orangey-tan ware, is unique. RK-82 (fig. 3, XII) is probably a ring-foot, though it might be a lid. It has a buff slip on the exterior. RK-110 (fig. 4, XXVI) is of a form new to this



FIG. 4. *Sherds from Rohel-jo-kund.* ½

area and has been mentioned just above because of the reddish wash inside. Fig. 4, XXVII [RK-139] shows an unusual jar-rim of rather gritty ware with plain orangey-tan surfaces.

Before we consider the designs on the forms just described the type of paint used must be mentioned. With the exception of red-brown paint on RK-135 (pl. III, 39), it is dark-brown to black-brown. With this, in the bichrome examples, is used a red-brown to light red-brown paint. RK-182 (pl. III, 43; fig. 3, IX) is the only specimen showing the use

[1] The thickness taken was always the normal wall-size rather than thickened portions, as sometimes found at the neck or maximum diameter.

[2] RK-13 is buff-slipped outside only above the carination. Inside it is lightly scored in horizontally well-spaced lines.

of more than two, differently coloured paints. When found it bore yellow, blue-green and brown paint, but the first two have now disappeared. There are five specimens with red-brown horizontal bands below or above the design zone and three in which this red-brown paint was used to fill certain areas in the design. There are only seventeen certain examples of unpainted vessels in this sample.[1] It is to be noted that most of decorated vessels have a brown band painted just inside the rim.

Those familiar with the pottery of Baluchistan and Sind will, on glancing at the illustrated designs, recognize certain patterns distinctive of the Nāl and Amrī cultures, and, in addition, some which may belong to both. The designs will now be described according to this classification, while a little later on we will give the proof for the attributions now made.

The *pīpal*-leaf is found on nine specimens, where observable in a panel, with scalloped right triangle filling the upper corners (pl. II, 11; fig. 3, XIV) [RK-122], or repeated in a zone (pl. II, 13) [RK-136]. In only two cases is the leaf vertically divided as on fig. 5, XVIII [CJK-8]. There are two examples of branches with barred, lentoid leaves (pl. II, 14) [RK-85], the unillustrated specimen with the branch in a panel formed by vertical lines. Outlined circles form the design in six cases, where observable in panels (pl. II, 15) [RK-172], though once repeated (pl. II, 18) [RK-116]. On one specimen the panel with circles alternates with another filled with 'omegas' (pl. II, 12) [RK-146]. Zones of opposed, reversing elements are illustrated by pl. II, 19 [RK-30] (two examples), pl. III, 41 [RK-93] (two examples), and pl. II, 20 [RK-95]. In three cases minor design zones are filled with double zigzags (pl. III, 43) [RK-182], in three with triangles whose apexes do not touch the opposite border (pl. II, 22 and 23) [RK-152, 1], and in one with opposed triangles whose apexes touch the opposite border (pl. II, 21) [RK-19]. Two examples of obliquely-filled panels were found, RK-88 (pl. II, 17) and RK-185 (unillustrated but showing the upper left-hand corner of the panel of pl. V, 54 [RD-75]). Another sherd is decorated with a panel formed by vertical lines with only a scalloped right triangle (see pl. II, 11 and 25) [RK-122, 149] preserved in the upper left corner. Pl. II, 24 [RK-140] shows repeated hooks rising from a line inside a bowl. There are several specimens with animal designs, RK-120 (pl. III, 40), a fish probably with traces of red-brown paint filling the head area, RK-149 (pl. II, 25) and RK-160 (pl. II, 16).

There are only a few sherds with designs which are probably Amrian, RK-135 (pl. III, 39) and probably RK-16 (fig. 3, XI) and RK-49 (pl. III, 26).

The remaining designs may be either of the Amrī or Nāl types or a mixture of the two styles. These include a panelled branch (pl. III, 27) [RK-8/9], loop-designs (pls. II, 22 and III, 28) [RK-152, 115], and several animal-patterns: RK-1 (pl. II, 23), either a bull or a curved-horned animal, with traces of red-brown paint in the leg-shoulder area, RK-150 (pl. III, 29), with red-brown paint filling the area between the two lines of the lower border, and RK-19 (pl. II, 21) and RK-4 (pl. III, 32). There are also three other unidentifiable animal-designs, in two of which large areas or perhaps the whole body is solidly painted. Fish are represented on four sherds, RK-3 (pl. III, 35), RK-43 (pl. III, 30), RK-120 (pl. III, 40) and RK-142 (horizontal inside a bowl and similar to RK-3 with a body pattern of wavy lines behind vertical lines). Occasionally loops (as on pl. VI, 66) [JK-10] and large zigzags are found on jars. Narrow zones are not uncommonly filled with repeated oblique lines (pl. III, 34) [RK-171], vertical lines (fig. 3, XIII) [RK-50], vertical strokes (pl. III, 31) [RK-166], chevrons, either free of the borders (pl. III, 33) [RK-153] or attached to them (fig. 3, XII) [RK-82], reversing oblique line groups (pl. III, 36) [RK-35], a simple zigzag (pl. III, 38) [RK-53], and cross-hatch (fig. 3, XIII) [RK-50], which also occurs in broader zones. Unique are the reversed, opposed, cross-hatched

[1] Mr. Krishna Deva's original notes record that plain and painted sherds were in about equal proportion.

triangles of RK-100 (fig. 3, XIX) and the panel-designs of RK-124/125 (pl. III, 37) and RK-144 (pl. III, 42).[1] Vertical line-groups (fig. 3, XXI) [RK-13], possibly without fill in the panels formed, are also represented.

There are a few flint blades, typically narrow, with triangular or trapezoidal cross-sections. Only a couple of them have intentional retouch on the edges, and in one case a chip has been removed from the bulb of percussion. One horned, miniature (length, 1·2 inches) animal-figurine, without hump, in plain tan clay, has spread-eagled, solid legs.

The pottery-designs which are certainly or most probably the products of Nāl pot-makers are found on 37 of the 75 decorated sherds. The *pīpal*-leaf in panel, with various types of fill-elements in the upper corners (pl. II, 11) [RK-122],[2] is found fairly commonly on Nāl pottery, while the repeated *pīpal*-leaf (pl. II, 13) [RK-136], with or without fill-motifs at the upper border, occurs sporadically.[3] In Baluchistan the *pīpal*-leaf is always divided down the middle (fig. 5, XVIII) [CJK-8], the Sind form thus being a variant of the standard Nāl form. In this respect the branch with barred, lentoid leaves (pl. II, 14) [RK-85] is also a variant. It too occurs at Nāl and other sites,[4] but usually with the vertical separation of the *pīpal*-leaf. No more distinctive design could have been found than the outlined circle motif of pl. II, 12 [RK-146]. At Nāl this pattern, particularly when alternating with panels filled with 'omegas', is one of the commonest designs.[5] Zones of elements opposed and reversing from top and bottom borders (pl. II, 19) [RK-30],[6] pl. III, 41 [RK-93],[7] pl. II, 20 [RK-95][8] are also characteristically Nāl. The double zigzag of pl. III, 43 [RK-182] is typical of minor design zones on Nāl pottery,[9] but the other two forms of this design (pl. II, 21 and 23) [RK-19, 1] are not. They might be Amrian motifs,[10] but are probably variants of the more usual Nāl design. Obliquely divided panels are another common Nāl design, though usually in the form of pl. II, 17 [RK-88][11] rather than that of pl. V, 54 [RD-75].[12] The hook-design of pl. II, 24 [RK-140]

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[1] On RK-144 the area in the panel outlined by curved lines above and to the lower right is filled with red-brown paint.

[2] This is D-24 of Hargreaves' classification in *MASI.*, 35 (Calcutta, 1929), pl. XVII. Only two complete pots with this design were found at Nāl, ibid., Appendix IV, nos. 96, 194, but there are also a dozen sherds with this design in the Nāl collection at the Central Asian Antiquities Museum, New Delhi. It occurs at a good many sites in southern Baluchistan (*MASI.*, 43 (Calcutta, 1931), pls. II, Kar. b. 4; XXV, Siah. 4; XXVI, Nun. 18).

[3] This pattern is known from Nāl, *MASI.*, 35, pl. XXI, 4; *ARASI.*, 1904-5, pl. XXIV, 8, 13 (almost identical with RK-136), and occurs on several sherds in the Nāl collection. So far, it is not certainly represented from other Baluchistan sites.

[4] Nāl: *MASI.*, 35, pl. XVII, 25; *ARASI.*, 1904-5, pl. XXIII, 2. Other sites: *MASI.*, 43, pls. I, P.H. 2; II, B.R. 1, 2, 15.

[5] *MASI.*, 35, pl. XVII, 36. Thirteen vessels with this design are described in Appendix IV. In the sherd-collection there are around 50 examples of the outlined circles and 40 where these circles alternate with omega-filled panels.

[6] Ibid., pl. XVII, 18; 3 vessels in Appendix IV, 6 examples in the sherd-collection.

[7] Ibid., pl. XVII, 19; only one vessel in Appendix IV, but 9 examples in the sherd-collection. See also *MASI.*, 43, pls. XXV, Nun. 5; XXXIII, Sun. 1.

[8] *MASI.*, 35, probably included under 17 of pl. XVII; a dozen examples in the sherd-collection.

[9] Ibid., pl. XVII, 49, with 15 examples described in Appendix IV and some 45 specimens in the sherd-collection.

[10] Compare *MASI.*, 48, pls. XXVI, 24 (Ghāzī Shāh) and XXX, 44 (Chauro Landi).

[11] The exact form of the design on pl. II, 17 (RK-88) is unsure. It could be either design 26, 28 or 29 of *MASI.*, 35, pl. XVII, of which there are seven examples listed in Appendix IV. See also *MASI.*, 43, pls. I, T.K. 8; XXV, Nun. 1, 15.

[12] This design is found at several sites, ibid., pl. XX, Ash. 5, Pak. 13; also unpublished examples from several others.

is found on Nāl pottery [1] but is equally frequent with a different ware found by Stein in Las Belā. The specimens from Sind [2] have, therefore, two possible sources. The animal-designs of pls. II, 16, 25 and III, 40 [RK-160, 149, 120] are in the Nāl style in which the beasts are outlined and certain areas partitioned by lines, the whole probably intended to be filled with various colours.[3] In contrast is the animal of pl. II, 23 [RK-1], whose vertical bar-fill and solid middle area suggest a different style, as do similarly the designs of pls. II, 21 and III, 29 and 32 [RK-19, 150 and 4].[4] The large loops of RK-155 (as pl. VI, 66) [JK-10], though unrepresented in the sherd-collection from the more elevated portions of southern Baluchistan, are found on Nāl pottery. This type of pattern is, however, known elsewhere in Sind,[5] so it is not certain that it is a Nāl design at this site.

Only a few patterns can be considered surely Amrian. The suspended loop-pattern of pl. III, 39 [RK-135] is frequent in Baluchistan.[6] However, the shape of the little vessel on which this design is found and its occurrence at most Amrian sites [7] suggest that it is more apt to be Amrian here than Nāl. The design of pl. II, 22 [RK-152], though not exactly duplicated in the Amrian repertoire, is again more likely to be Amrian than Nāl.[8] This is also the case with the tree-design of fig. 3, XI and pl. III, 26 [RK-16, 49], which bears no resemblance to known Nāl plant-patterns and may possibly be Amrian.[9] RK-8/9 (pl. III, 27) cannot certainly be ascribed to either the Amrī or Nāl cultures. The simple, fringed branch has so far been found in neither. The vertical, black-edged, red-brown band flanked by lines may well be a Nāl motif.[10] RK-35 [11] (pl. III, 36) and RK-144 [12] (pl. III, 42) are probably Amrian, since known from other sites in Sind but not on Nāl pottery. Of the four fish-designs, that shown on pl. III, 30 [RK-43] might

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[1] In Hargreaves' classification this was included under design 5, bordered chevrons, *MASI.*, 35, pl. XVII, 5. Three examples occur on brown-slipped bowls, listed in Appendix IV as nos. 46, 48, 68. At other sites where it has been found in Baluchistan we cannot be sure whether this design is on Nāl or Las Belā type pottery.

[2] *MASI.*, 48, pls. XVIII, 27 (Amrī, photo inverted); XXIV, 33, 34 (Lohrī); XXVII, 15, 24 (Ghāzī Shāh); XXVIII, 32, 37 (Pānḍi Wāhī).

[3] *MASI.*, 35, pls. XVIII, 9; XXI, 8, 14. *MASI.*, 43, pls. XX, Hor. 3; XXI, Zik. 6; XXV, Nun. 7, iv. 12; XXVI, Nun. 17, 20, 21; XXVII, Nun. iv. 1, 2.

[4] Cf. *MASI.*, 48, pl. XXX, 47 from Tando Rahīm khān.

[5] Ibid., pls. XXIV, 24 (Lohrī); XXV, 20 and possibly 14 (Damb Būthī); XXX, 41 (Tando Rahīm khān); and unpublished sherds from Pānḍi Wāhī, nos. 127, 164.

[6] As examples the specimens from Siāh-damb, Nundarah on pl. XXV of *MASI.*, 43.

[7] *MASI.*, 48, pls. XVIII, 3 (Amrī); XXIV, 27 (Lohrī); XXV, 12, 34 (Damb Būṭhī); XXVIII, 3 (Pānḍi Wāhī); and XXX, 11 (Chauro Landi), 16, 18 (Tando Rahīm khān).

[8] The opposed triangles of the top zone have just been discussed. The filled loop design of the main zone is probably a variant of a pattern found at Amrī (ibid., pl. XVIII, 23) and many other Amrian sites. The closest parallel is found at Chauro Landi (ibid., pl. XXX, 21). The fringe above this zone is usually found inside bowls and rising from a line at Amrī (nos. 207, 370, 447), Chauro Landi (nos. 5, 88), Lohrī (no. 49), Tando Rahīm khān, (no. 49) and is alone illustrated from Damb Būṭhī (ibid., pl. XXV, 13).

[9] This inference rests on a sherd from Pānḍi Wāhī (no. 5) with solidly-painted, in-curled, tapering-ended leaves identical with RK-49. This sherd may, however, be early Harappan. It is over-fired, with a black core, and has a brownish wash outside and thinly inside. The shape, on the other hand, is the steep, slightly inverted beaker form illustrated on fig. 5, XX (JK-1).

[10] It is very common at Siāh-damb, Nundarah, *MASI.*, 43, pl. XXVII, Nun. iii. 1, v. 1.

[11] *MASI.*, 48, pls. XVIII, 1 (Amrī); XXVIII, 23 (Pānḍi Wāhī).

[12] This attribution rests on the presence of the same type of panel divider at Damb Būṭhī (nos. 61, 76), for the rest of the design is unparalleled.

be a Nāl composition.[1] That with the solidly painted head (pl. III, 35) [RK-3] is not in the usual Nāl style,[2] but there are no examples on Amrian pottery with which it might be compared.

Zones of simple elements, vertical lines, cross-hatch (fig. 3, XIII) [RK-50] and bordered chevrons (fig. 3, XII) [RK-82] are found commonly on the pottery of both cultures. In contrast, the simple zigzag of RK-53 (pl. III, 38) and the oblique bars of RK-171 (pl. III, 34) are known from Nāl sites[3] but not in Sind. Repeated vertical strokes (pl. III, 31) [RK-166] and chevrons unattached to the borders (pl. III, 33) [RK-153] may be limited to Amrian pottery.[4] Despite the present known distribution of these simple motifs, the future may well show them shared by both the Amrī and Nāl cultures.

It is not only in designs that the pottery of Rohel-jo-kunḍ shows characteristics of the Nāl and Amrī ceramics. The ware, surface-finish,[5] and paint of both are very similar. The forms also show both Amrian and Nāl types. The large pots and jars (fig. 3, XV, XVI, XIV, X) [RK-81, 121, 122, 149],[6] the small bowls with erect or slightly inverted or everted rim-sides (fig. 3, XXI) [RK-13],[7] and the bowl series which usually has brown slips (fig. 3, IV, III, II; fig. 5, III) [RK-45, 89, 93; RD-77][8] are all found in Nāl pottery, though the latter two occur with some frequence at Amrian sites. Moderately large, steep-sided bowls with tapering rims (cf. fig. 3, XXIV) [RK-120][9] and small pots (fig. 3, XX) [RK-17] both occur in Nāl pottery, but the latter shape[10] is also known in Amrian ceramics. The only certain Amrian vessel-type is that of fig. 3, XVII [RK-186].[11] Fig. 3, XI [RK-16] probably shows another Amrian form, but so far it is known from very few sites and one of the examples may be Harappan.[12] Of unusual shapes, fig. 3, XIII [RK-50]

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1 On Nāl pottery fishes' bodies are occasionally cross-hatched, as here (*MASI.*, 35, pl. XX *b*), though the form of ibid., pl. XVII, 62 is much more typical.

2 See ibid., pl. XIX, 4, however.

3 Zigzag: ibid., pl. XVII, 50; *ARASI.*, 1904-5, pl. XXIII, 4. Oblique bars: ibid., pl. XVII, 2, and an unpublished fragment from Awaran Niābat (*MASI.*, 43, p. 129), which is only a small bowl and in shape and design is almost identical with the examples from here.

4 Vertical strokes: *MASI.*, 48, pls. XXIV, 26 (Lohrī) and XXV, 23 (Damb Būṭhī). Chevrons: unpublished from Amrī (no. 370) and Ghāzī Shāh (no. 327), but known on one example from Baluchistan (*MASI.*, 43, pl. II, B.R. 11).

5 Only the polychromy of pl. III, 43 (RK-182) and the slips of pl. III, 30 (RK-43) are distinctively Nāl. The treatment of the latter is the same as on vessel, type 2, of Hargreaves' classification (*MASI.*, 35, pl. XVI, 2 and p. 47), in which the interior and exterior below a ridge is covered with a brown slip, while the design-area above the ridge outside is buff-slipped or plain.

6 This is basically the form of type 7, ibid., pl. XVI, which is shown in jar-size in *MASI.*, 43, pls. V, Kar. a. 1, XXV, Nun. 11; XXVI, Nun. 38.

7 See *MASI.*, 35, types 3 and 6, pl. XVI. Such bowls do not all have the very flat lower side of the illustrated vessels. The same rim types are also not infrequent in Amrian pottery.

8 These are in the range of type 1(*a–d*) of ibid., pl. XVI, though RK-45 (fig. 3, IV) has a rim less vertical than is usual in this series. This form may share the same origin as the hook design sometimes found in it, so we cannot be certain that the Sind examples: *MASI.*, 48, pls. XXIV, 33, 34 (Lohrī); XXV, 28 (Damb Būṭhī) and unpublished specimens from Amrī (nos. 457–59), Chauro Landi (nos. 48, 83), Pānḍi Wāhī (nos. 22, 24, 232) and Tando Rahīm khān (nos. 49, 57), are due to the presence of or influence from the Nāl culture.

9 Unpublished so far, but occurring sporadically at several sites.

10 At Nāl, the smaller sizes of type 2, *MASI.*, 35, pl. XVI. For a published example from Sind, see *MASI.*, 48, pl. XXXVIII, 1 (Amrī).

11 Ibid., pls. XXV, 34 (Damb Būṭhī); XXXVIII, 11 (Amrī).

12 Pānḍi Wāhī: no. 117 and ibid., pl. XXVIII, 1 and p. 109 (from the Harappan level); Chauro Landi: no. 18; and Kohtras Būṭhī: no. 58 (ibid., pl. XXIX, 31). The design of the last specimen may prove to be of the early Harappan period.

shows a Nāl form,[1] while RK-82 [fig. 3, XII][2] and RK-100 [fig. 3, XIX][3] have parallels in Sind.

Before considering what this mixture of Nāl and Amrian pottery signifies, we must examine the chronological position of these remains. No Harappan pottery or other objects were found (above, p. 17) and there seems little doubt that the site is pre-Harappan. The polychrome sherd of pl. III, 43 [RK-182] and the style of painting suggest that the Nāl pottery is from a late stage of this culture. It is closer to the style of Sohr-damb, Nāl than to that of Siāh-damb, Nundarah, which is stylistically and presumably chronologically early.[4]

Rohel-jo-kunḍ is unique among the Sind sites so far discovered in showing a large number and rich variety of motifs peculiar to Nāl pottery, a number of which have been found for the first time east of Baluchistan. Indeed much of the pottery is so characteristically Nāl that it seems reasonable to conclude that we have here a settlement of people from the later stages (see preceding paragraph) of the Nāl culture. Probably they were in contact with or living with people of the Amrī culture. Of this latter fact we cannot be sure. The depth of the deposit was very shallow, and it is possible that it represents a mixture of originally distinct settlements. Evidence from other sites in Sind confirms, however, the likelihood that this Nāl settlement at Rohel-jo-kunḍ was contemporaneous with the Amrī culture.

Nāl pottery has been found in Sind in three different archaeological conditions.[5] In the first, the remains are surface-finds or from unsure stratigraphic conditions at sites with both Amrian and Harappan remains. These have no bearing on relative chronology, but illustrate Baluchistan-Sind contacts. From the water-logged site of Lohrī was found a sherd with design duplicated at Nāl [6] only, and another [7] with the pattern shown on pl. V, 54 [RD-75], but with the interior of the inner circle filled with red-brown paint. At Rājo-ḍero (see p. 25) was found a sherd (pl. V, 54) [RD-75] and a flat-shouldered, miniature canister (RD-42, see below, p. 26) of the form of fig. 3, XIII [RK-50]. Three sherds with *pīpal*-leaf designs as on pl. II, 13, [RK-136] were found at Jare-jo-kalāt (nos. 11–13, below, p. 27). Here may also be mentioned a similar *pīpal*-leaf pattern probably intrusive in Harappan levels at Lohumjo-daro.[8]

The second archaeological condition is the discovery of Nāl and Amrian pottery, as at Rohel-jo-kunḍ, on the surface or at very shallow depths. In this case the chances are good that the two kinds of pottery are contemporaneous, but only because Nāl pottery has been found stratified with Amrian in pre-Harappan layers (see just below). Two Nāl sherds have been found at Damb Būṭhī. We publish here one (fig. 5, XIV) [DM–1] which in form and design is unmistakably Nāl.[9] That previously published [10] is of the same form as the

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[1] This is a miniature example of type 5, *MASI.*, 35, pl. XVI.

[2] Possibly no. 233 from Pānḍi Wāhī; *MASI.*, 48, pl. XVIII, 13 from Amrī; nos. 17 and perhaps 39 from Bandhnī; and no. 10 from Chauro Landi.

[3] Amrī, no. 339.

[4] In agreement with Stuart Piggott, op. cit., p. 16.

[5] Some of this discussion recapitulates a certain amount of evidence presented by one of the writers in the *Journal of Near Eastern Studies*, V (1946), p. 288, n. 8.

[6] *MASI.*, 35, pl. XVIII, 12.

[7] *MASI.*, 48, pl. XXIV, 14 (photograph should be oriented 90° to left).

[8] Ibid., pl. XXII, 32. Though described with Jhukar pottery, p. 58, note gives the findspot for Lh 178 as Trench I, −2·7′, which is the Harappan level. The form of this sherd is that of fig. 3, XXI [RK-13], while the interior of the suspended semicircle at the upper left is painted red-brown.

[9] *MASI.*, 35, pl. XVI, 5 for the form and pl. XVII, 52 for the design.

[10] *MASI.*, 48, pl. XXV, 1. The design is that of *MASI.*, 35, pl. XVII, 26.

fragment just described and has blue-green paint filling one of the stepped triangles and the bands bordering the design zones. It is the second polychrome Nāl specimen from Sind. In addition there is a crudely-made, small canister[1] clumsily imitating the Nāl form. Several Nāl sherds mixed with Amrian are also known from Tando Rahīm Khān[2] and Chhuṭī-jo-kunḍ (fig. 5, XVIII) [CJK-8].

At only two sites, Pānḍi Wāhī and Ghāzī Shāh, has Nāl pottery been found in stratified relation to Amrian and Harappan remains. At Pānḍi Wāhī with Amrian pottery in pre-Harappan levels are found outlined, stepped diamond designs; obliquely divided panels; and probably alternating, opposed, right-triangle patterns.[3] The situation at Ghāzī Shāh is different. Here a design inspired by the outlined circle pattern of Nāl is found, from the Amrian up into the Harappan level,[4] on bowl-forms, which are not Nāl or Amrian shapes, and which are covered with a light red-brown wash which may be burnished, close to the typical Harappan finish. Apparently this design was taken over and used for a time at the beginning of the Harappan period. This inference is reinforced by the similar treatment of another motif[5] which seems to be characteristic of an early stage of the Kulli culture, but is usually found in Baluchistan on buff-surfaced pottery.

This evidence, limited though it is, all seems to suggest that the appearance of the Nāl culture or imports from it in Sind are contemporary with the Amrī culture and are pre-Harappan. Another feature of interest, which is indicated at Ghāzī Shāh, is that in its early stages in this area the Harappan civilization was still in a fluid state and had not crystallized in the patterns which are so characteristic of its mature form.

3. Surface-finds from other sites

The following section deals with surface-finds from four sites, all lying within a radius of ten miles from Rohel-jo-kunḍ. Of these the first to be considered is Rājo-ḍero (fig. 1) which is situated in the plains about eight miles to the north-east of Rohel-jo-kunḍ. The actual mound is locally known as Wāmanshāh-jo-daro. It is 20 feet high and covers an approximate area of eight acres, now mostly occupied by modern graves, and is reported to have yielded, besides the material noticed here under the site-name Rājo-ḍero, also copper implements in the course of the digging of graves by the local people.

Rājo-ḍero is shown by its surface-finds to contain both Amrian and Harappan levels. The Amrian pottery, however, does not seem completely typical. In the small sample of around 50 sherds there is a considerable amount of plain buff ware, and a smaller number with plain, light-tan or more reddish surfaces. There are also some sherds with the usual

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1 *MASI.*, 48, pl. XXV, 33.

2 Ibid., pl. XXX, 26, 40, 42 and unpublished fragments of the type of pl. XXX, 40, 42, numbered 20, 42, 45.

3 Stepped diamonds: ibid., pl. XXVIII, 18 and p. 110, from Trench I at plus 3·2′, also, unpublished, no. 158. This design occurs on five sherds in the Nāl collection. See also *MASI.*, 43, pls. I, Z.W. 7; XXV, Nun. 9; XXVI, Nun. 28, 32, 33. Obliquely divided panels: *MASI.*, 48, pl. XXVIII, 22 and p. 110, same level as XXVIII, 18, and pl. XXVIII, 8 (form on pl. XXXIX, 13), p. 109, from plus 2′ in Trench I. Stepped right-triangles: pl. XXVIII, 17 and p. 110, on plain reddish ware and found between plus ·5′ and −3·2′ in Trench I. Harappan pottery is only found down to plus 8′ (pp. 91-92). Note that Trench I is apparently labelled Trench II on the plan, pl. XLV, and that the text uses the top of the mound, plus 21′, as datum, while the notes on pp. 109-10 use the ground level, ±0, as datum.

4 Ibid., p. 81, gives the following sequence (datum the top of the mound): Harappan pottery down to about −30′, mixed Harappan and Amrian at −30′ to −35′, Amrian pottery from −35′ to −42′. The design in which we are interested was found at the following depths (given on pp. 98-99): −30′, Gs. 166, 235, 163 (pl. XXVII, 47, 52, 53) and Gs. 249; −32′, Gs. 200; −35′, Gs. 303; −39′, Gs. 253-54.

5 Ibid., pl. XXVII, 25, 35, 36.

buff slip on the outside. But the bulk is with surfaces of buff or buff-shades, as one expects of Amrian pottery. There are a few bowl-fragments of the forms shown on fig. 3, IV, III; fig. 5, III [RK-45, RK-89; RD-77] with brown slips inside and outside or only partly outside with the rest of the exterior plain or buff-slipped, or only inside while the exterior is plain or buff-slipped.

The pottery-shapes are bowl or small pot-forms. The latter are found in the types seen on fig. 3, XVII [RK-186], fig. 3, XX [RK-17], and fig. 5, XI [RD-15]. Quite possibly the second form had a base like that of RD-56 (fig. 5, VI). RD-69 (pl. IV, 51; also fig. 5, VII) is in this range of shapes and is interesting because of its unusual finish. It is of pale tan ware, with a buff slip outside, but the area below the middle of the fragment is unevenly covered with a beige slip of appreciable thickness which probably contains fine sand (below, p. 30). The bowls have the form of fig. 3, XXI [RK-13] but they may be as large as 8 inches in diameter and have more vertical rim-sides. The types with brown slips have been noted above. RD-49 (fig. 5, I; pl. V, 59) is unusual in its steep side and the presence of a red-brown wash or slip only below the lines inside.[1] To be noted also are a small vessel of the form of fig. 3, XIII [RK-50] with a zone of vertical bars just below the shoulder and a little cup (fig. 5, V) [RD-90] in plain, buff ware.

Among the typical Amrian designs are the vertical lattice of pl. IV, 44 and 45 [RD-9 and 26]; joined, solidly painted small diamonds and triangles (pl. IV, 46 and 47) [RD-18, 17] on small pots; rows of chevrons (pl. V, 57) [RD-32] on bowls of the type of fig. 3, XXI [RK-13]; a zigzag pattern like that of pl. III, 38 [RK-53] on a small pot; plain cross-hatched zones on bowls of the type of fig. 3, XXI [RK-13]; and minute zones of vertical lines (pl. IV, 48) [RD-11]. Unusual designs are shown by pls. IV, 49, 50 and V, 54 and 58 [RD-16, 6/25, 75, 41].[2] There are two other sherds with horizontal bands of red-brown paint, RD-30, a vertically sided bowl of the type of fig. 3, XXI [RK-13], and RD-28, a miniature hole-mouth pot.

Among the Harappan sherds are a few painted examples. Pl. V, 53 and 55 (also fig. 5, II) [RD-50/82, 45] show an interesting jar-shape (of which there is a third example) with an unusual design on a red burnished slip. The design is not typically Harappan, but there is a little evidence (p. 25) that the designs of the earliest stages of the Harappan civilization were not so limited as in the later, mature phase. Pl. V, 56 (also fig. 5, VIII) [RD 47] shows another peculiar form and a less strange, but nevertheless a typical, design and a polished red slip with a slightly brownish tone. This fragment is also slipped inside, where unburnished. There are a number of fragments of small pots of the form of pl. VI, 65 [JK-19] with red-brown to red slips outside which may be polished. Interesting is fig. 5, X [RD-53] (with a buff surface inside which is polished on the upper half and a polished red slip outside) whose profile is like that of some steep-sided Amrian pots (cf.

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[1] It is of orangey-red clay showing some mica, with plain surface which is much scraped outside and shows a hand-finish inside.

[2] Pl. V, 54 [RD-75]: orangey-tan ware; plain; vertical side with thickness of ·28 inch and diameter of approximately 12 inches. The extreme top band may be of red-brown paint. For the Nāl affinities of this design, see p. 24. Pl. IV, 49 [RD-16]: tan ware; buff slip outside; profile of fig. 3, XVII [RK-186] with thickness of ·24 inch and rim-diameter 6·3 inches; paint brown and red-brown, the latter filling the central circle in the panel. This design may be connected with the outlined-circle pattern of Nāl pottery. Pl. IV, 50 [RD-6/25]: pale beige ware; buff slip outside; vertical, convex side with thickness of ·24 inch and diameter approximately 9·5 inches; paint black-brown and weathered, light reddish-brown in the band forming the lower border of the design-zone. Pl. V, 58 [RD-41]: beige ware; probably plain; bowl rim, concave outward, much like fig. 2, VII [PK-5] but at a 45° angle; thickness ·28 inch; paint brown, light red-brown for the oblique lines filling the leaves.

fig. 5, VII; pl. IV, 51) [RD-69]. The large bowl of pl. V, 60 (also fig. 5, IV) [RD-46] is close in shape to the bowls from Rohel-jo-kunḍ of fig. 3, VII, VI [RK-46, 105] and yet is covered inside and out with a burnished red to red-brown slip and has a *pīpal*-leaf scratched on its outer surface. Fig. 5, XII [RD-85] shows another Harappan bowl rim with red polished slip on both surfaces. Two large feet of dish-on-stand (fig. 5, XIII) [RD-72] were also found with red-brown slips on the exterior. A typical jar-stand with a buff slip covering all surfaces is to be seen on fig. 5, IX [RD-71]. Two holes, out of probably four, are preserved.

Among other objects collected is a fragmentary toy-cart frame and a considerable number of fragments of clay bangles, either plain, tan or buff-slipped, with diameters from 4-5 inches and circular cross-sections ·48–·64 inch thick. A number of them are painted on the outer edge in brown or red-brown paint with oblique lines, chevrons, or the spirals seen on pl. IV, 52 [RD-2]. Several narrow flint blades were discovered, one with a fine nibbling retouch vertically on both edges, another with the retouch on one edge only.

Though there are only a handful of sherds from CHHUṬI-JO-KUNḌ (fig. 1), which is situated on the Nāi Gāj 4 miles to the west of Rohel-jo-kunḍ, they present much the same picture as that already known from Rohel-jo-kunḍ. The ware is usually buff with plane surfaces, but tan and tannish-buff shades occur with exterior buff slips.

A number of the fragments are from small bowls with nearly vertical rims, but the form of fig. 3, XXI [RK-13] is represented, as are brown-slipped, hemispherical bowls (see fig. 3, III) [RK-89] and a pot-form similar to fig. 3, XIV [RK-122]. There is only one Nāl design, the repeated, divided *pīpal*-leaves of fig. 5, XVIII [CJK-8], on a bowl of the shape of fig. 3, XXI [RK-13]. Pl. VI, 61 [CJK-7] shows a chevron form of the hook design which is inside a hemispherical bowl with dark red-brown slip inside and out as at Nāl. The real hooked form of this design is also found (cf. pl. II, 24) [RK-140]. Amrian designs are seen in zones of vertical lines (in one case two such zones with one of them flanked by red-brown bands of paint), bordered chevrons (fig. 3, XII) [RK-82], and bordered vertical lines with a double wiggle (pl. VI, 64) [CJK-12]. The joined, obliquely barred diamonds of pl. VI, 62 [CJK-3] and the panel-design of pl. VI, 63 [CJK-4] are also characteristically Amrian.

JARE-JO-KALĀT (fig. 1) is situated on the left bank of the Nāi Gāj, about 5 miles up Rohel-jo-kunḍ. It is a plateau, roughly 30 feet high, with occasional indications on the surface of ancient dry-built walls of river-worn boulders and with sherds sparsely scattered over an area, roughly measuring 125 feet square. The plateau is rocky and shows a shallow settlement.

At this site only a few painted sherds were picked up. Three of these are Nāl, with ware as at Rohel-jo-kunḍ, forms similar to that of fig. 3, X [RK-149] and *pīpal*-leaf designs as on pl. II, 13 [RK-136]. Pl. VI, 66 [JK-10] shows a loop-pattern on a bowl with slightly-modelled rim, which is comparable to certain Nāl designs (see p. 22). There is no painted Amrian pottery, with the possible exception of JK-4 which bears the design of pl. III, 34 [RK-171]. Several Amrian vessel forms are, however, represented by the steep-sided, tall pot seen on fig. 5, XX [JK-1] (note the incised mark on the side); the small pot type of fig. 3, XX [RK-17]; a bowl with rim close to that of fig. 3, VI [RK-105]; and a fragmentary beaker side with the ridge of fig. 3, XI [RK-16].[1]

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[1] This sherd, JK-24, is of tan ware with orange-toned beige surfaces, probably burnished inside. It may, therefore, be Harappan.

The few Harappan fragments include two sherds with foliage-patterns on burnished red and plain brown slips. We may mention also an incised plate-stand, the small pot buff-slipped except for a red-brown wash above two paired lines on the shoulder (pl. VI, 65) [JK-19], and the jar shown on fig. 5, XXI [JK-20] which has a light red-brown wash outside and ·72 inch inside, where the side is flat-ribbed.

NAZGĀNI-JO-KUNḌ (fig. 1) is another site situated on the left bank of the Nāi Gāj, about 1 mile up Rohel-jo-kunḍ. Like Jare-jo-kalāt, it is perched on a rocky plateau about 30 feet high, and shows on the surface sherds, sparsely scattered over an area roughly measuring 50 feet square. The occupation here is very shallow and has left no traces of structures on the surface. The Amrian pottery from Nazgāni-jo-kunḍ is with few exceptions in ware of tan shades, with buff slip outside and sometimes also inside.

Two jars of the shape of fig. 5, XVI [Naz-1] were found, but most of the sherds are from bowls of the type shown on fig. 3, XXI [RK-13]. A few fragments are from brown or red-brown slipped bowls. One specimen, with the form of fig. 3, VII [RK-46], has a rim-diameter of 14 inches and thickness of ·36 inch, and bears a buff slip inside and outside over a rough, unsmoothed surface. Fig. 5, XVII [Naz-6] shows an unusual base in plain, buff-tan ware with hand-finished surfaces, and is perhaps hand-made. Another fragment has a profile similar to that of fig. 3, XVIII [RK-186].[1] The few painted sherds are decorated with the repeated squiggles of pl. VI, 68 (also fig. 5, XVI) [Naz-1], the lentoid zigzag of pl. VI, 67 [Naz-3],[2] a bichrome variant of the same pattern [Naz-13] ,[3] and double zigzag patterns as on pl. VI, 69 [Naz-8], in other cases with the fill-triangles attached to the borders. Naz-19 (fig. 5, XV) shows an unusual surface-treatment, grey-brown slip inside and out, except between the lines where it is red-brown, with burnish inside and outside. This and another burnished, brown-slipped fragment, may indicate Harappan influence though no Harappan finds were made at this site.

We take the opportunity afforded by this article to publish a few specimens from the Sind collections which add to our knowledge of Amrian ceramics and Baluchistan-Indus contacts. Pl. VI, 73 (Mar-1), from a site called Mari Khān,[4] shows a stand[5] which in design and bichromy is typically Amrian. From this site also comes the bowl or cup shown on pl. VI, 71 [Mar-9][6] with fine comb-incision. This same type of incision, which is not as deep as that of the presumably Harappan pots of pl. I, 6 and 8 [PK-27, 16], has also been found at Amrī (pl. VII, 77) [Am-318],[7] Ghāzi Shāh,[8] Lohrī (pl. VII, 80) [Lr-228][9] and Pānḍi Wāhī (pl. VII, 75) [PW-275].[10] From the standpoint of ware, surface-finish, paint and form these fragments are Amrian. But they do not permit us to

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[1] Dark red-orange ware; possibly traces of a buff slip outside over a sandy surface with much mica; hand-made.

[2] On a rim of the form of fig. 3, XVII [RK-186], diameter 4·7 inches.

[3] Dark brown and probably light chocolate brown paint, the latter forming the inner lentoid.

[4] This is in the Johi *tāluka* and was visited from Lohrī on the 26th December, 1930. Both Amrian and Harappan pottery were collected.

[5] Buff ware; plain; paint dark brown and chocolate brown. The bottom is also painted with four bands, filled with chocolate brown paint, as on the top.

[6] Buff ware; plain; brown paint.

[7] Tan ware; buff slip outside; chocolate brown paint; maximum diameter *c.* 4·5 inches; form of *M.A.S.I.*, 48, pl. XXXVIII, 3.

[8] Gs-329; light tan ware, probably plain though possible traces of a buff slip outside; on the shoulder of a pot with inverted rim.

[9] Lr-228; beige ware; whitish-buff slip outside; same form as Am-318. Also Lr-5, 49.

[10] PW-266, 275; both of tan ware with buff slip outside and small pots similar in form to Am-318.

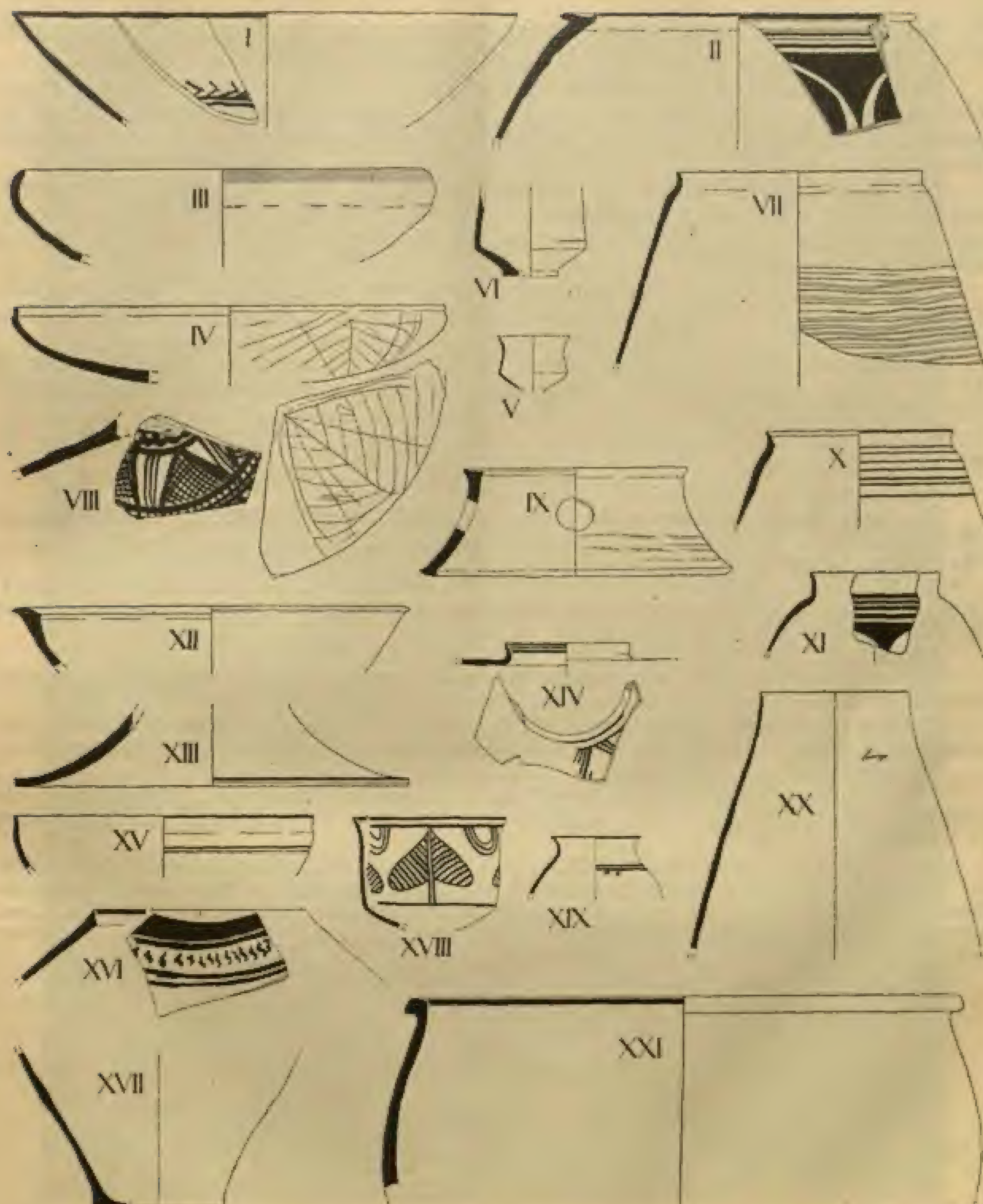


FIG. 5. *Pottery from: I–XIII, Rājo-ḍero: XIV, Damb Būṭhī: XV–XVII, Nazgāni-jo-kunḍ: XVIII, Chhuṭi-jo-kunḍ; XIX–XXI, Jare-jo-kalāt.* ¼

say that incision is characteristic of Amrian ceramics, since this form of decoration may have been borrowed during a time of Harappan influence.

Another unusual surface treatment, the use of a slip of sand, is Amrian, for it has been found on the undecorated areas below typical design-zones (pl. VII, 78) [Am-340]. It is, however, found only at Amrī,[1] Ahmad Shāh,[2] and Rājo-ḍero (pl. IV, 51) [RD-69] (above, p. 26).

Pl. VII, 79 [Am-192] shows an interesting model, probably of a tool. If inverted, and pierced above the present break, it could have been a model chariot, but the first explanation seems more likely. It is buff-slipped with black-brown paint and may be Amrian rather than Harappan.

From the Naig mound [3] comes a pot-shoulder shown on pl. VII, 76 [Naig-1],[4] which unquestionably is the product of someone from the Kulli culture of Baluchistan.[5] Most of the finds from this mound seem to be Harappan, though one sherd is Amrian.

We also publish an unusual sherd (pl. VI, 70) from Mohenjo-daro [6] which is one of the most interesting finds made at a Harappan site illustrating contact with the Kulli culture. Certain elements in the design are unparalleled elsewhere, but others [7] are so typical of the Kulli culture that it is safe to conclude that this vessel was painted by someone from or familiar with that culture.

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[1] Am-340 (pl. VII, 78): tan ware; plain; steep-sided as *MASI.*, 48, pl. XXXVIII, 10. Am-138: tan ware with buff slip outside; hand-finished interior; joined, obliquely barred, diamond-pattern. Am-388: tan ware; plain, bichrome decoration.

[2] *MASI.*, 48, p. 139. All the sherds from this site seem to be Amrian, but few are decorated. AH-4: orange-tan ware; plain; on shoulder of jar of the form of ibid., pl. XXXIX, 8. AH-17: light brown ware; buff slip outside; on shoulder of jar of the type of ibid., pl. XXXIX, 3.

[3] Ibid., p. 88.

[4] Tan ware; hazel wash outside with a slightly orange tone; paint brown, dark red in the two zones flanking that with the little ibex; thickness ·16 inch; maximum diameter *c.* 6 inches.

[5] The design is somewhat sketchily drawn. For the joined circles (usually at Kulli-damb with dots inside) and the ibex, cf. *MASI.*, 43, pl. XXI, Kul. 1. iv. 3. Suspended loops are common in the design of the Kulli culture but are usually found below the design zone as on ibid., pl. XXI, Kul. 1. iv. 1.

[6] This is numbered DK(B) 794 and was found from the late period at Mohenjo-daro. It is of light greyish-brown ware, with a buff slip outside. The paint is dark brown, except for the interior of the animal's body which is a reddish-brown.

[7] The fringed claws of the animal: see *MASI.*, 43, pl. XXIV, Baz. 3 (this sherd is on its side, as photographed, and should be oriented 90° to the right); also several unpublished examples from Kulli-damb. The double-meander element between the rear legs and the comb-element over its rump: ibid., pl. XXI, Kul. I. vi. 1, and many unpublished and published examples from this and other sites of the culture. For a tree in a similar position under an animal's legs, see ibid., pl. XXVII, Mehi 14.



Pottery from Pāi-jo-koṭiro



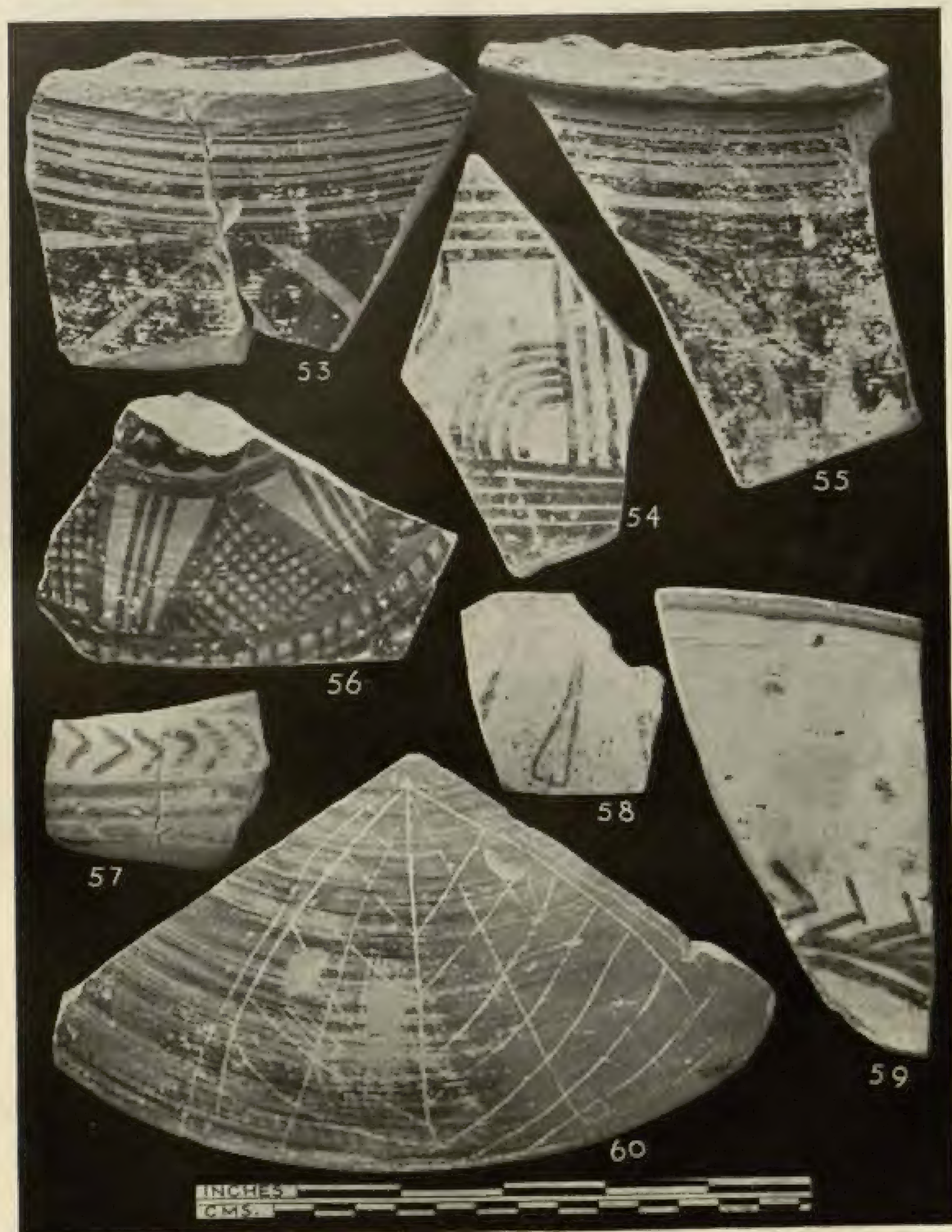
Pottery from Rohel-jo-kund



Pottery from Rohel-jo-kund



Pottery from Rājo-ḍero



Pottery from Rājo-ḍero



61–64, pottery from Chhuṭi-jo-kunḍ; 65-66, pottery from Jare-jo-kalāt; 67–69, pottery from Nazgāni-jo-kunḍ; 70, pottery from Mohenjo-daro; 71–73, pottery from Mari Khān



74-75, pottery from Pāṇḍi Wāhī; 76, pottery from Naig; 77–79, pottery from Amrī; 80, pottery from Lohrī

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Pot with painted ornament, probably found near Quetta (Lahore Museum). Ht. 11 inches. (Photo: Lahore Museum)

SASSANIAN MOTIFS ON PAINTED POTTERY FROM NORTH-WEST INDIA

By Stuart Piggott

The cultural contacts between India and Persia in the prehistoric and later ages have left many marks on the relics of India, on images, coins and mural paintings. In the following paper, Professor Piggott deals with the Persian influence on painted Indian pottery of the post-Christian period. The number of specimens on which he has found this influence is not considerable, but the fact that it has been detected even on a few is of importance to Indian archaeology.

THE vigorous prehistoric painted pottery traditions of western India, originating on the eastern fringe of the Iranian early metal age cultures probably at least by the fourth millennium B.C., have had a remarkable survival value as a peasant craft which continues to such a degree that not only do painted wares continue to be made in the remote villages, but even in the comparatively sophisticated bazars of the Frontier towns one may still buy pots which, once reduced to sherds, would offer the archaeologist an unpleasantly difficult task in dating. Much painted pottery collected by Aurel Stein and others from Baluchistan and adjacent regions of western India, while it falls outside the known prehistoric groups and may sometimes be associated with, e.g., iron objects implying a relatively late date, can still only be vaguely classed as 'post-prehistoric' in the lack of distinctive stylistic criteria or its occurrence in a scientific excavation, but it is the purpose of these notes to draw attention to certain pottery from the Quetta region painted with designs derived from those popular on Persian textiles of the sixth and seventh centuries A.D.

The best preserved specimen (pl. VIII) is unfortunately the least adequately documented. In Lahore Museum is a group of three painted pottery vessels, two decorated with roughly executed curvilinear and spiral designs, but the third and largest having a more ambitious scheme of ornament which falls within the scope of the present discussion. This vessel is globular with a short everted neck, with four loop-handles joining the rim to the upper part of the body, which is painted with a broad zone of plain plum-red colour. Below this, and above the maximum girth of the pot, is a band consisting of a row of open discs with the spandrils between them hatched, the whole painted in purple-red on a buff-white background. This background is continued over the main area of the vessel below this 'pearled' band, which is occupied by four large roundels of similar design and colour, each with a border made up of discs with hatched intervals similar to the upper band. Within these pearled roundels is in each instance a very crudely drawn design recognizable on analogy as the 'senmurv' or hippocamp, which, within such a roundel, forms a characteristic feature of Sassanian ornament, known best from textiles. Despite the poor quality of the painting, the derivation of the motif is obvious.

Unfortunately the provenance of this and the two smaller vessels is not recorded in the Museum, but apart from the intrinsic probability of a north-west Indian origin there is some evidence for the probable find-spot of at least the large vessel with which we are concerned. In reporting on the finds from his trial-excavations on the early historic site at Mastung, thirty miles south of Quetta, Hargreaves describes a sherd (his no. 31) 'having a buff ground decorated with circles in black and chocolate, floral forms and the head of a bird(?)' which he compares with a vase, then in Lahore Museum, which came from Baleli near Quetta.[1] The Mastung sherd is not illustrated by Hargreaves, nor can it now be found

[1] H. Hargreaves, 'Excavations in Baluchistan 1925', *Mem. Arch. Surv. Ind.*, no. 35 (1929), p. 5.

unsafe owing to the decay of Roman power in the west and the waning Chinese influence in the east after the Han dynasty had come to an end at the beginning of the third century, with the result that the route lay open to the attacks of nomads and brigands. But with the establishment of the strong T'ang dynasty in the opening years of the seventh century control was once again obtained over the route, and Persian products could be traded eastwards, ultimately, as we have seen, sufficiently far to inspire Chinese craftsmen in the eighth century.

Sassanian contacts with India had been established at least as early as Chosroes I (531–579), to whom is attributed the introduction of chess from India into Persia and who certainly received tribute from Indian princes, and it seems likely that the stoppage of land-trade east of the Oxus in the fourth and fifth centuries turned the attention of Sassanian merchants not only to the sea-ways, but also to the caravan-route turning south-eastwards from near Merv through Alexandropolis (Kandahār) to India—a route by which Rome had been trading with China through Indian middle-men in the first century A.D.[1] Quetta, at the head of the Bolan Pass giving access to the Indian plains, is on the site of an inevitable trading centre to which the route continuing eastwards from Kandahār would lead, and where the famous Sassanian textiles brought as part of the merchants' stock-in-trade would serve to introduce novel motifs to the local pot-painters.

[1] Huzayyin, op. cit., p. 108 with references.

MEGALITHIC TYPES OF SOUTH INDIA

By V. D. Krishnaswami

The Prehistorian of the Department of Archaeology reviews in this paper the existing confusion in the use of the megalithic terminology and attempts its scientific definition and standardization which has been accepted by the Department and is considered suitable for adoption by all students of archaeology and allied sciences. He also discusses the types of megalithic monuments so far discovered in South India and compares them with those of North-east India where megaliths still constitute a living culture among some aboriginal tribes.

THE initial requisite for any systematic exploration is a precise and self-explanatory nomenclature. In this respect the current terminology of Indian megalithic literature is of no help, for terms such as cromlech, dolmen and cairn are used by various writers in entirely different senses. Thus Taylor [20] (1848) uses the term 'cromlech' for both a dolmen and a closed cist, while Rea [16] in 1912 (and recently others also) uses it for a stone-circle round a burial urn or sarcophagus. The word 'dolmen' again is used in Pudukkottai [21] indiscriminately for underground cists and single urn-burials with a capstone. The word 'cairn' is used in Hyderabad [20] for a cist-grave; Breeks [3] working in the Nilgiris uses it to mean stone-circles of any kind, while elsewhere it means nothing except a promiscuous heap of rubble hiding any kind of grave. Again, working in Hyderabad as late as 1923, Hunt [12] merely follows the past local usage in calling a cist-burial a cairn.

The terms 'menhir', 'alignment' and 'avenues' denote monuments which may not prove to be really such, for it often happens that a series of stone-circles suffer mutations which may give to unrelated stones the appearance of 'alignments' and 'avenues'. Also one stone of a circle sometimes happens to be taller than the others and may be mistaken for a menhir; in such a case the circumstance is not necessarily insignificant but menhir is a wrong description. Fragmentary stone-circles have been so described at Tachampatti and Surandapatti in Pudukkottai, while both 'false' and real menhirs occur in the Hyderabad State (a false example at Lingampalli, and real ones at Hanamsagar and Evathalli). Care must be taken, therefore, in the application of our terminology.

Next in importance to an unambiguous terminology for purposes of classification are regional surveys of the prehistoric tombs and their accurate planning with uniform conventions. This necessity has been emphasized even in England by Dr. Daniel [5] writing as late as 1938 and Dr. Clark [6] in 1939. The necessity is all the greater in India, where a 'survey' has not been attempted yet and all megalithic work has been quite casual and unrelated and mystified in language scarcely to be understood. The 'murky fog' surrounding the megalithic question in India remains as dense as ever and no pains will be too much for accurate planning of megaliths on conventions internationally acceptable. Dr. Clark's conventions are the ones adopted in our Survey. Monuments are defined through the morphological and other intrinsic features they actually present and the descriptive terms in current usage such as dolmens, cists, cairns, menhirs, etc. are adapted with precision.

Since 1944 three regions have been submitted to detailed ground survey in South India—Chingleput District * adjoining Madras and the States of Pudukkottai † and Cochin.‡ The prehistoric monuments in each of these three areas, while belonging to a common megalithic complex, are so varied in type that it is necessary to describe them in some detail before evolving a provisional terminology. Definitions of the technical terms adopted in our Survey are tabulated at the end of this paper (vide Appendix B).

Quite a different megalithic complex is found in North-east India (vide Appendix A) in Assam and Chota Nagpur where the Austro-Asiatic languages are spoken. Megalithism here is still a living characteristic of the Khasis and the Gonds. Menhirs for instance are still erected by the Khasi woman to 'memorialize' her husbands indicative of the antiquity of the polyandric characteristic of their society.

From the types of monuments alone in South and North-east India irrespective of their eschatalogical nature, it may be inferred that several megalithic waves must have reached India both from the West and the East.

Chingleput, on the Coromandel Coast (approximately three times the size of either Pudukkottai or Cochin State) is a megalithic province in itself, differing in certain respects from both the States named, which in turn differ from each other. Chingleput has a megalithic individuality of its own in that the 'dolmenoid cists', so far as known, invariably enclose a terracotta legged sarcophagus, a feature not known in the other two regions.

Cochin, typical of the Kerala Coast, is famous for its 'hood-stones', *topi-kals* and underground rock-cut caves, none of which crosses over to the east of the Ghats.

Pudukkottai is characterized by the elaborate transepted port-hole cist which has yet to be found outside the State.

I. TYPES IN CHINGLEPUT

Two distinct types of megaliths are found in the Chingleput area. They are styled (*a*) the 'dolmenoid cist' and (*b*) the 'cairn-circle', denoted respectively by the terms D and C.

(*a*) The dolmenoid cist is a burial-chamber made of stones both for the sides and the cap, the whole circumscribed usually by a single stone-circle or sometimes by double circles.

In the northern lateritic region the dolmenoid cist (pl. IX A) is made up of dressed lateritic orthostatic stones either monolithic or multiple to form a compact rectangular chamber. The chambers are invariably oriented in an east-west direction. The stones are cut and dressed only on the inside of the chambers. The major part of the chamber is sunk underground rising only 1 foot to 2 feet above ground. Thus the monument is a large cist rather than a dolmen. Usually the chamber is circumscribed by a stone-circle of externally dressed boulders. This is type D_1 and is characteristic of the lateritic region and maintains these characteristics even when it straggles into the southern granitic region. The type-sites are at Pottur, Amarambedu and Pondavakkam.

In the southern granitic region, there are two sub-types of the dolmenoid cist, namely D_2 and D_3. Sub-type D_2 (pl. IX B) is characterized by rude granite blocks (just as they

* Obviously the existing political boundaries and the ancient cultural limits of the Chingleput region and the States will not coincide. We have yet to delimit by further explorations the spread of the respective funerary cultures of these three regions.

† The Survey in Pudukkottai State in October 1945 was facilitated by the generous hospitality of the late Sir Alexander Tottenham and by the collaboration of Mr. K. R. Srinivasan, the then Curator of the State Museum.

‡ In Cochin State Sir George Boag rendered valuable help in February 1946 in the carrying out of the survey of megaliths which was possible through the collaboration of Mr. P. Anujan Achan, the State Archaeologist.



A. *Dolmenoid cist (type D_1) at Pottur, Red Hills, Chingleput District*



B. *Dolmenoid cist (type D_2) at Sankarāpuram near Conjeeveram, Chingleput District*



A. *Sarcophagus within dolmenoid cist (type D_2) at Kāvānur near Madurāntakam, Chingleput District*



B. *Menhir at Anapāra (Villadam) near Trichur, Cochin*



A. *Legged terracotta sarcophagus at Pallāvaram, Chingleput District*



B. *Dolmenoid cist (type D_3) at Vaiyāvur near Madurāntakam, Chingleput District*

PLATE XII

To face plate XIII



A. *Cairn circle (type $C.U._{iii}$) at Madavilāgam near Madurāntakam, Chingleput District*



B. *Pyriform urns under barrows at Amrithamangalam near Satyavedu, Chingleput District*



A. *Cairn (type C.U.-1) at Kalasakkādu near Pudukkottai*



B. *Cairn circle (type C.U.-m) at Poyyāmani, Pudukkottai*



A. *Pyriform urn found beneath cairn (type C.U.$_3$), Pudukkottai Museum*



B. *Transepted cist with antechamber (type K.T.$_a$) at Tāyinipatti, Pudukkottai*



A. *Transepted cist (type K.T.$_{4}$), showing internal features, at Sittannavâsal, Pudukkottai*



B. *A typical port-hole cist at Brahmagiri (cf.* Ancient India, *no. 4, pp. 187 ff. and pl. LXXXI B)*



A. *Hood-stone at Cheramanangād near Eyyal, Cochin*



B. *Handleless umbrellas or* kundan-kudai *used by Pulayas near Pālghāt, Malabar District*



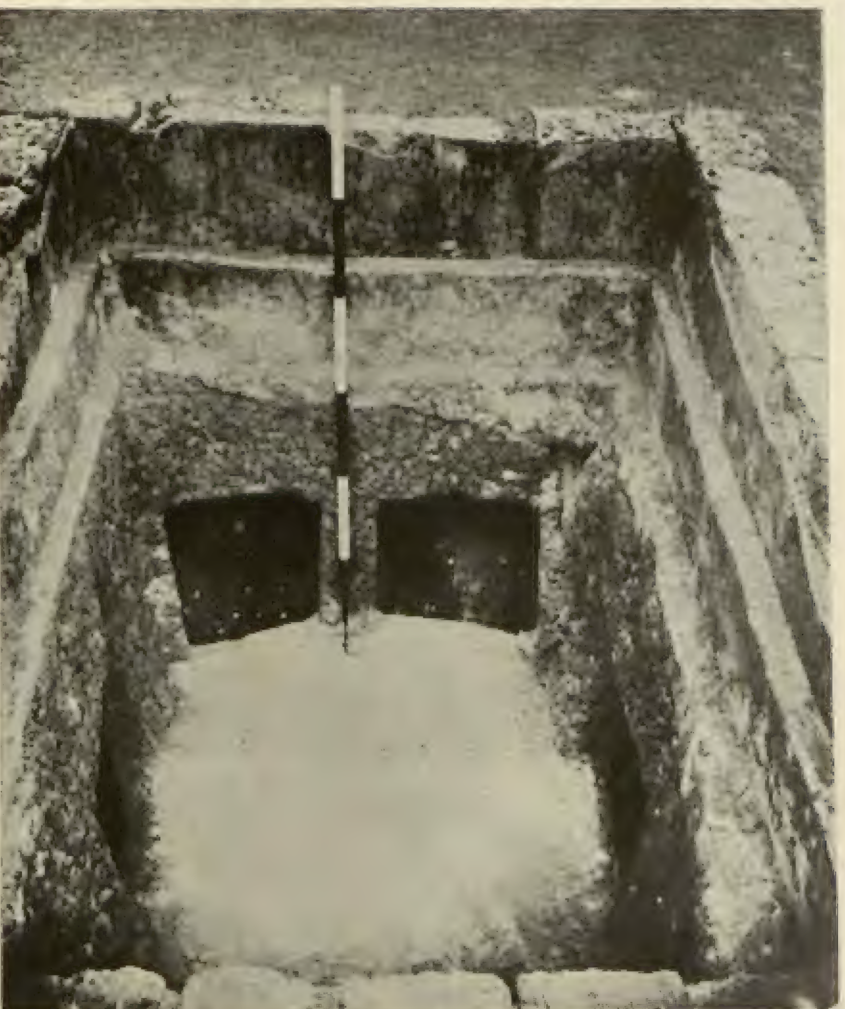
A. *Multiple hood-stone at Cheramanangād near Eyyal, Cochin*



B. *Alignment with a table-stone at Laikor in Assam. (After P. R. T. Gurdon)*



A. Topi-kal *at Cheramanangād near Eyyal, Cochin*



B. *Multiple-chambered rock-cut cave at Kāttakampāl near Kunnamkulam, Cochin*

come from the hills or rocky outcrops) both for the chamber and for the bounding stone-circles. There is complete absence of dressing in the majority of sites. The orthostatic rude stones do not therefore form a compact chamber though the gaps between the orthostats are packed with débris. On the orthostats is set a rude capstone and the whole monument resembles a half-submerged dolmen. The capstone also in its turn is sometimes monolithic and sometimes multiple. The chamber being irregular, with gaps between the rude stone orthostats, there is no definite orientation for the chamber or for the capstone that covers it. The significant orientation is, presumably, that of the enclosed sarcophagus (pl. X A), which is invariably placed east-west in this region. These monuments are surrounded by rude stone-circles with rubble packing. When the chamber is low, the cairn packing sometimes covers the entire monument including the capstone. This type is very common.

Sub-type D_3 (pl. XI B) is a variation of type D_2, the only difference being that the rude stone orthostats in this class are almost completely buried so that the capstone poised on them appears to be at ground level. In such cases a cairn sometimes conceals the entire monument, including the capstone. This type occurs side by side with type D_2 but in smaller numbers.

(*b*) The cairn-circle (pl. XII A), symbolized by the letter C, comprises a stone-circle surrounding a cairn. Beneath the cairn is found a single urn, multiple urns or a legged terracotta sarcophagus. These varieties will be connoted by the symbols $C.U._1$ (cairn with single urn); $C.U._2$ (cairn with two urns); $C.U._m$ (cairn with multiple urns); and C.S. (cairn with sarcophagus).

Of these $C.U._m$ is the most common and is always found in association with D_1, D_2 and D_3. C.U. and C.S. were observed by Rea in 1905 at Perumbair in Madurāntakam tāluk. In the northern lateritic region the cairn-circles show dressing in the stones used, whilst in the southern granitic region the stones are all rude granitic blocks. The actual burial-contents, however, appear to be similar in both regions.

In association with the megaliths of the northern (lateritic) part of the district, is occasionally found a third type of monument, the barrow or earthen mound. Round about Red Hills near Madras and at Amrithamangalam are vast areas of high lateritic ground in which are discerned both pyriform urns (pl. XII B) and legged sarcophagi without cists or other enclosures (pl. XI A). On the surface, the site is indicated by low barrows, made almost imperceptible by erosion but distinguishable by the chips of granite-spread * over the individual barrows. This type is styled B. Similar burials are alleged by Rea[17] to have existed at Pallāvaram round about Trisulam, but this is essentially a megalithic area and the observation may be faulty.

II. TYPES IN PUDUKKOTTAI STATE

This small State abounds in megalithic monuments of two major types:—(*a*) *the cairn type* and (*b*) *the cist type*.

The sub-types of the cairns are $C.U._1$ (cairn with single urn), $C.U._2$ (cairn with two urns) and $C.U._m$ (cairn with multiple urns) as at Chingleput. The terracotta sarcophagus is wholly absent in the State. The stone-circle of $C.U._1$ is always less than 12 feet in diameter. The (large) circles of $C.U._m$ are in a few places (e.g. Kalasakādu and Sokkanāthapatti) invisible but may be inferred.

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* A superficial observation of these is likely to be mistaken by archaeologists or geologists for weathered remnants of intrusive masses of granite. In reality the sections at Erumaivettipalayam and at Ambattur show that the underlying rocks are grits of the Cuddalore series passing down into Sriperumbudur shale.

C.U.$_1$ is typical of Kalasakādu (pl. XIII A) and occurs in association with C.U.$_m$ and also with the cist type. C.U.$_2$ is scarce but C.U.$_m$ (pl. XIII B) is the most common. The last is found invariably associated with the cist type in most of the sites.

The cist type.—Here the orthostats are all monolithic slabs. They occur with one exception as transepted cist K.T.$_a$ (cist, transepted with antechamber).

The exceptional non-septed type K presents itself as a solitary instance only at Sittannavāsal. The arrangement of the orthostats in it is in clockwise *svastika* pattern.

The other or the transepted type (pl. XIV B), which forms the majority, presents in all cases an antechamber with port-hole in the main cist-wall which partitions the two. The antechamber is, except on one site at Tayinipatti where it occurs to the west, always to the east of the cist. The location of the antechamber is sometimes on the northern and sometimes on the southern half of the cist. The septum of the cist (pl. XV A) is always oriented east-west and divides the cist into two roughly equal parts. One of these, not approached from the antechamber, is again divided into an upper and a lower half by a horizontal slab and access to each is through separate port-holes, cut into the septal slab, one vertically below the other. This type of cist is always surrounded by a demarcation stone-circle and when the cist is nearly or wholly underground, is covered by a cairn. The transepted cist of Pudukkottai is the most elaborate type of cist-burial in South India and has not yet been met with elsewhere.

The cairn-circle and the cist types are not mutually exclusive in this region but occur promiscuously.

III. TYPES IN COCHIN STATE

In Cochin State, as in the whole of Kerala the geological and physiographic features fall into three well-defined parallel strips, each of which contains distinctive monuments; the nature of the monuments being determined largely by the material available.

Thus, dolmens, both 'multiple' (i.e., several within a single stone-circle) and 'isolated', are to be found in the eastern mountainous region composed of granitic gneiss and charnockite; the rock-cut caves, menhirs and megaliths of the umbrella series on the lateritic plains; and urn burials with some menhirs on the alluvial sea-board.

Multiple dolmens

A number of dolmens bounded by a single stone-circle would indicate the communal character of these monuments. Groups of such monuments—one group containing as many as nineteen at a place near Varadarappalli in the Palappilli Reserved Forest—occur mostly on the gneissic uplands of the Kerala region, and they are built on bare rock within 3 or 4 feet of each other. Each dolmen has five stones, four for the orthostats and one for the capstone. The orthostats made of rude stone-slabs, 6 to 8 inches in thickness, are placed in a *svastika* pattern, either clockwise or anti-clockwise. The orientation of these dolmens is invariably east-west, and on the average they measure 5′ 0″ × 2′ 6″ × 2′ 3″ in height on the inside. The inner surface of the orthostats is smooth and indicates dexterity in slab-quarrying. Such dolmens, with the number of monuments in each group and the size of the bounding circle varying, may be seen near Varadarappalli in the Palappilli Reserved Forest at Karikulam near Kannathupādam within a Rubber Estate at Pattikād on the hills of Vellanimalai Reserved Forest and in the Vāniampāra tract. Similar rude slab dolmens have been reported also in the neighbouring Travancore State, but so far neither their plans nor any grave goods recovered from them have become available to archaeologists.

Dolmens of a similar character, but isolated, are also to be found in the State, and some of them have also a port-hole opening. Near Adirapalli falls of the Chālakudi river, for

instance, is a low dolmen surrounded by a cairn of gneissic rubble concealing the monument almost up to the capstone. The monument is oriented north-west to south-east and there is a U-shaped opening cut from the top of its north-western orthostat.

Port-hole cist

It is an underground box-like structure made first by scooping out a rectangular chamber in the laterite and then lining the floor and the sides with granitic slabs and lastly by covering the whole with a granitic roof-slab. The trapezoidal port-hole in the eastern orthostat is externally blocked by a separate smaller slab on the outside. On the ground-surface the cist is surrounded by a stone-circle, of dressed lateritic boulders.

A clear port-hole cist with a bench inside occurs at Porkalam and three more dilapidated cists in its vicinity, two of them surrounded by a common stone-circle, must also have belonged originally to the same type. This port-hole cist is, therefore, allied to the Sūlūr type[16] of cist in Coimbatore and to the port-hole cist at Tiruvilvāmala discovered by Govinda Menon,[9] which has yielded the red-ware, decorated with yellow wavy lines, dating probably from just before the beginning of the Christian era to the first or second century A.D. Within the same class, probably, fall the dolmens reported on the slopes of Pattiattukunnu on the borders of Palayannur Reserved Forest.

Menhirs

Menhirs, in the Kerala country, are rooted mainly to the laterite and are scattered far and wide. Usually they are monolithic rude granitic slabs, oriented north-south and standing high above the laterite ground. The menhir at Ānapāra (pl. X B) is locally known as *Patakallu* or *Pulachikallu*, the former name suggesting a memorial-stone on a battle-field, while the latter would commemorate a Pulachi who died at the spot. Similar monoliths are seen at Kuttūr, Choorakāttukara and Muttam. The area round Kuttūr menhir is dreaded by the local people as being haunted by ghosts. Similar monoliths are also met with in Malabar and Travancore State, and trial excavations made by Vasudeva Poduval[13] on a group of four menhirs at Devikulam revealed a burial-urn underneath, with pottery and iron objects placed inside it.

An 'alignment' of menhirs of different sizes, the largest 12 feet 9 inches high, 7 feet 6 inches at foot and 1 foot thick at the top, is reported at Komalaparathala. Another monument near Tiruppunitara is a variant and consists of a monolithic pillar of laterite, round in section and rudely dressed. In its vicinity is the broken stump of another menhir.

Umbrella-stone

Topi-kal and *kudai-kal* are the two terms used by local people for the monuments belonging to the umbrella-stone series, and they were first rendered into English as 'hatstone' and 'umbrella-stone' by J. Babington[14] in 1819.

Each *topi-kal* (pl. XVIII A) or 'hatstone' (*kal-kudaikal*) rests upon four quadrantal clinostatic stones joining up together into a square at the base on the outside and bevelled in such a way as to close up along the diagonals of the square. The outer surface of each clinostat is finely dressed so that the figure of the monument becomes a well-finished paraboloid. This is truncated near the top for the circular capstone to rest on a rather small flat surface. The 'hatstone' proper, i.e. the capstone, is a low cone on a wide circular base, the edge of which is chamfered towards the inside presenting a circular edge with a pendant appendage. At close quarters these characteristics make a *topi-kal* or a 'hatstone' resemble a crudely executed stone model of the elevated ceremonial umbrella common all

over Kerala. *Topi-kals* have a definite orientation in that each of the quadrantal clinostats faces one of the cardinal directions.

Ariyannur and Cheramanangād in Cochin State are the two main sites containing *topi-kals*, which, seen from a distance, resemble a crop of giant mushrooms.

Hood-stone

The 'hood-stone' (pl. XVI A), a dome-shaped dressed lateritic stone, is, like the *topi-kal* described above, except that it has no parabolic support of clinostats. The capstone, which is all the stone used, rests directly on the ground. Locally it has a resemblance to the *kundan-kudai* (pl. XVI B), the handleless hollow umbrella, whence Babington [14] translated the term as 'umbrella-stone'. Porkalam and Cheramanangād are the main sites where 'hood-stones' are to be found.

Within the hood-stone class must also fall the irregular granitic rude stone-slab, as at Cheramanangād, placed likewise flat on the ground and possibly concealing an urn-burial below.

Multiple hood-stone *

Intermediate between the 'hood-stone' and 'umbrella-stone' is the monument which may be described a 'multiple hood-stone'. In this monument (pl. XVII A), the striking feature visible from above is a big circle of sectorally dressed clinostatic lateritic stones presenting the same pattern of dressing as is observable in the quadrantal stones of the *topi-kal*. The number of stones in the circle varies from 5 to 12 and, though all tend to converge towards the top, they do not join up, as the quadrantal stones do in a *topi-kal*. These leave a big circular gap in the middle and the upper surface of the stones does not show any indication of a stone being placed on top. Erosion of the interior earth-pack in some of these monuments revealed multiple hood-stones or *kudaikals* at ground level, 3 in one case and 5 in another. Two monuments of this nature may be seen at Cheramanangād.

Rock-cut caves

For the construction of these caves the surface mass of laterite is first scooped out by the cave-builders, sinking thus a stepped pit into the rock, usually rectangular or nearly rectangular of varying depth. Into the straight face of rock is then cut a small rectangular entrance, either a little above the floor-level of the open quadrangle or flush with it. Through this narrow opening, measuring on average 1½ feet square, which hardly permits a man to crawl through on all fours, is the hard laterite hollowed out and the cave shaped and fashioned. The floor of the interior of a cave is invariably 1 foot to 2 feet lower than the floor of the court outside. In most of the caves it is circular or oblong on plan while the vault is dome-shaped, although caves with a rectangular floor and horizontal ceiling are also known. On the sides of a cave are benches (which are raised platforms) cut out of the rock and varying from 6 inches to 2 feet in height. But the benches are a variable feature. Some of the caves have a single bench, only on one side, while others have no bench at all.

A rock-cut pillar, square, rectangular or round, is sometimes left standing in the middle of the floor rising to the centre of the vault; for instance in the caves at Porkalam and one of the twin caves at Eyyal. But the central pillar is, sometimes, absent, as at Chovvanur, Eyyal and in the multiple-chambered cave at Kāttakampāl (pl. XVIII B). In yet another type there is a circular opening in the centre of the domed vault. The caves at

* First discovered in our survey as a new type, though casually remarked on by Sen Gupta.[19]

Kandānasseri and Kakkād belong to this class. In a multi-chambered cave the same outer court leads to different caves in front and on sides. At Eyyal the common court leads to the main chamber and on the right hand side to a smaller chamber. At Kāttakampāl two chambers are situated laterally in front, while two others, one on each side, face each other across the open court.

The pottery and iron implements recovered from these underground caves, as also the fact that they sometimes occur in association with cists and monuments of umbrella series, clearly endow them with a sepulchral character.

Appendix A

Megalithic types in North-east India

The aboriginal tribes of Assam,[10] Chota Nagpur and Bastar [8] have a living megalithic culture. At the present day that culture is ridden with superstitious rituals and 'taboos', and in many places the megalithic monuments have been giving place to symbolic wooden counterparts. While most often the megalithic monuments prevalent among these tribes are commemorative rather than sepulchral, at the present day they have lost their funerary significance by getting associated with the gorgeous but unrelated memorial feasts or *gota mela* [11] as they are called among the Bondos and Gadabas. The salient types of monuments are discussed here.

The existing tribes of these areas are principally the Maria Gonds in Bastar, the Oraons and Mundas in Chota Nagpur, the Bondos and Gadabas in Orissa and the Nagas and Khasis in Assam. Though their monuments exhibit an essential unity in their megalithic character they are diverse in ritualistic minutiae, due apparently to influences principally Austro-Asiatic and in a lesser degree Dravidian. These monuments include menhirs and their alignments, dolmens and stone-circles, stone-seats and 'cromlechs'.*

Among certain tribes like the Maria Gonds of Bastar [8], the menhirs and their alignments are known as *uraskal* (from Gondi: *urasna*, to bury) and the dolmens or table-stones are called *dānyakals*, which consist of a flat stone over supporting boulders, the latter being known as *odiyal*. The most common substitute in the present day among the Bastar Marias for the *uraskal* is either a cairn of stones with a flat capstone on top, called the *marmakal*, or a wooden pillar at the top of which are carved representations of birds.

With the Khasis [2] and Nagas of Assam the menhirs are very imposing and are in alignment (pl. XVII B) of odd numbers with heights varying from 2 to 14 feet though there may be exceptionally high menhirs [10] as the one at Nartiang, 27 feet high. The central menhir in the alignments is the tallest usually and is called *mawkni*, and a table-stone known as *mawkynthei* which is a sort of low dolmen about 2 feet above the ground (sometimes two such) is found in front of the central menhir. The alignments do not have any fixed orientation. In accordance with the matrilineal character of the Khasi society [7] menhirs are set up in honour of maternal uncles while the low dolmen represents a female ancestor. Here the menhirs appear usually to mark different stages in the journey of the soul to the clan ossuary where the bones are deposited ultimately.

The stone cineraria or clan ossuaries, called *mawbah*, are very common among the Khasis but not found among the Nagas; they are rectangular built-up chambers made of

* The term 'cromlech' is loosely applied (1) to denote sometimes a *handāl gharia* (ghost-throne), which is placed at the foot of the menhir and on which oblations are sprinkled; or sometimes (2) to the structural clan ossuary built of stone blocks and serving as repository for the uncalcined bones and ashes of the different members of a clan dying at different times. These clan ossuaries are most often rectangular chambers.

stone blocks. Access to the interior of these is got by removing one of the heavy stone blocks in front, since they are closed on all sides and there are no port-hole openings.

Stone-seats constitute large slabs of stone placed within the village, under which the bones of the dead are sometimes buried (possibly before their transfer to the clan ossuary, while an upright commemorative menhir is simultaneously erected outside the village).

In Chota Nagpur, among the Oraons and the Malers, the cairn-burial is practised. Here the dead is laid in a ditch dug out in which dry leaves and branches have been previously spread and wooden planks, personal belongings like cot, umbrella, etc. are laid, the ditch being then filled with earth and over it heavy stones of various sizes being heaped to form the cairn.

According to Walter Ruben [18] the ancient 'Asur' tombs and the megalithic culture of the Mundas of Chota Nagpur have a western origin, which reached India through Palestine and Persia in the early Iron Age and split in North India—one branch moving southwards and the other reaching eastwards as far as Chota Nagpur. The fact that all 'Asur' and Munda graves hitherto opened have contained iron implements may perhaps denote, according to von Haimendorf, an ancient contact here between the Austro-Asiatic populations and the materially more advanced people of the powerful South Indian dolmen-grave civilization, though Walter Ruben's theory is not enough to explain the kinship between the Central Indian and Assam megalithism and ritual differences.

Among the Bondos and Gadabas of Orissa,[11] we have what are called the stone-circles known as *sindibor*, the dolmens known as *gunom*, and the groups of stone-seats comprising some menhirs also, situated under the village trees, called *sodor*. While to the Gadabas, the *sodor* and *sindibor* mean merely aggregations of memorial stones, the Bondos look upon them as the seats of the earth deity so necessary for the promotion of fertility. The megalithic monuments of both these tribes belong undoubtedly, according to Haimendorf, to South-east Asiatic type (i.e., inclusive of Austro-Asiatic and Austronesian cultural influences). According to him the essential elements of the megalithic cultures of Assam and Chota Nagpur and Orissa, which belong to the 'South-east Asiatic' type, must have developed and moved with the great Austronesian migration in the movement of the Austro-Asiatic races westwards into Peninsular India.

The combined ethnological and archaeological evidence leaves no doubt that both these migrations occurred in neolithic times. This is shown by the clear co-ordination in India in the distributions of the neolithic shouldered polished celt and of the Austro-Asiatic languages; no other wave of people but the Austronesians could have been responsible for the spread of the highly developed neolithic civilization characterized by the long polished celt with quadrangular section, observed in the Peninsula as far south as the Godāvarī.[4]

On the other hand, the prehistoric megalithic monuments of South India belong to an altogether different culture which appears to have come into contact with the South-east Asiatic current; it is such a contact that could have given rise to the mixture of influences in monuments and rituals observable in these cultural regions which hitherto had remained difficult of reconciliation. Ehrenfels' correlation [7] of megalithism and Mother-right in India also seems to indicate that the former must have reached India not only in a series of cultural waves but also alike from the West and from the East.

The main factors of difference between the North Indian and South Indian prehistoric megalithic cultures are: (1) while the monuments of the former are memorials often unconnected with graves, almost every megalithic monument in South India is a tomb; (2) while the megalithic culture of the former belongs to the late (Neolithic) Stone Age, the South Indian megaliths seem to be essentially rooted in the Iron Age, supported as it is by the Brahmagiri excavations in 1947 [22]; and (3) while structurally there seems to be some link between the South Indian and the Mediterranean megalithic culture in their architectural

features and 'port-holes', etc., none of these is patent in the megaliths of North-east India.

APPENDIX B

Glossary of megalithic terms

The terms now used by the Department of Archaeology in India for megalithic and related monuments are given below. They are, of course, subject to extensive sub-division and amplification. By way of introduction it may be affirmed that megalithic (from the Greek: *megas*, great, and *lithos*, stone) monuments are made of large stones, usually but not invariably rough and unhewn, which conform to certain well-marked types.

1. *Alignment.*—A series of menhirs arranged in lines on some definite system.

2. *Avenue.*—Two or more alignments approximately parallel with one another.

3. *Barrow.*—A barrow is a mound (tumulus) made of earth. It may be either (*a*) circular on plan, in which case it is called 'round barrow' or (*b*) oblong or oval on plan, in which case it is called 'long barrow'. It may or may not contain a stone cist, built on or below the original surface of the ground. It may or may not be defined by a circle of stones or a ditch, or both.

4. *Cairn.*—A cairn is a barrow made of heaped-up stone rubble. Otherwise it may resemble any of the various types of barrows.

5. *Cist.*—A cist is a box-grave (pl. XV B) built of stone-slabs, normally below the natural surface of the ground; usually, but not necessarily, it consists of a single stone of orthostat for each side and a cover or capstone on top; it may also have a floor-stone. One of the orthostats is sometimes pierced with a circular, semi-circular or trapezoidal opening. When the opening is semi-circular it is cut into the top of the orthostat immediately under the capstone. The opening is called a 'port-hole'; and a cist with such an opening is called a 'port-hole' cist.

Cists are classified as 'small' up to 3 feet in length internally or 'large' above 3 feet in length internally. A large cist built above the natural surface of the ground and 3 feet or more in height may be described as a 'dolmen'.

6. *Clan ossuary.*—A cyclopean rectangular chamber built of stone blocks opened by removing one of the blocks in the front. This is erected either directly on the ground or on a stone platform and serves as a repository for the uncalcined bones and ashes of the dead. Known as *mawbah* among the Khasis of Assam.

7. *Cromlech.*—(Welsh: *crom*, bent and *lech*, stone). Also known as Cyclolith. This term has a varying connotation and will not, therefore, be used by the Department of Archaeology in India.

8. *Dolmen.*—(Celtic: *dol*, table and *men*, stone). A single slab of stone supported by several orthostatic boulders or slabs built on the surface of the ground in such a way as to enclose a space or chamber beneath the capstone. It may or may not be wholly or partially covered by a barrow or cairn. A dolmen may be with or without a port-hole.

Known in Bastar State where it is placed at the bottom of the memorial pillar as *hanāl gharia* (ghost-throne). Also known as *dānyakal* when the dolmens are low, the orthostats of which are locally known as *odiyil*. Known among the Bondos of Orissa as *gunom*. Tablestones, in association with menhirs among the Khasis in Assam, are known as *mawkynthei*.

9. *Hat-stone.*—Vide Topi-kal.

10. *Hood-stone.*—A dome-shaped dressed lateritic stone resting with its flat face directly on the ground. This type of burial is restricted to the Kerala region and is locally known as *kudai-kallu* as it bears a resemblance to the *kundan-kudai* the handleless hollow umbrella. Babington calls it 'umbrella-stone'.

11. *Menhir.*—Simplest of all the megalithic monuments, consisting of a single monolith set up, as a rule, at or near a burial spot. The monolith may be small or gigantic in height with its base fixed into the earth. In Bastar State, it is known as *uraskal* (Gondi: *urasna*, to bury and Dravidian: *kal*, stone) and usually occurs there in an alignment of menhirs. It may be either sepulchral or commemorative. The central menhir in an alignment among the Khasis of Assam is known as *mawkni*.

12. *Rock-cut caves.*—The practice of placing the dead in tombs (caves) cut out of the lateritic rock in Kerala is definitely to be associated with the megalithic structures.

13. *Sarcophagus.*—A cist (pl. XI A) often with legs or feet. In the present context it is always of baked earthenware or terracotta.

14. *Stone-circle.*—As its name implies it is a circle (sometimes oval or irregular in plan) built of juxtaposed stones. It is normally but may not always be an adjunct to a burial-ground. Known among the Bondos as *sindibor*.

15. *Stone-seats.*—The stone-seats of Assam tribes are mere stone slabs ceremonially placed under a village tree and apart from serving a ritualistic need are useful as seats for the travellers. Sometimes they overlie a pot of bones, prior to their removal to the clan ossuary. A group of them under the village-trees serve as a venue for village-council and disputes. Known as *sodor* among the Bondos of Orissa where they include some upright menhirs also.

16. *Topi-kal.*—(Umbrella-stone). (Hindi and corrupt Tamil, *topi* meaning 'cap'.) Known also as 'hatstone' following Babington and restricted to the Kerala region. Each *topi-kal* rests upon four quandrantal clinostatic stones joining up together at the base into a square, and dressed so as to give the shape of a truncated paraboloid to the entire monument. The *topi-kal* or the hatstone rests on the truncated surface.

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TEN YEARS OF INDIAN EPIGRAPHY (1937-46)

By B. Ch. Chhabra, N. Lakshminarayan Rao and M. Ashraf Husain

In this paper the officers of the Epigraphical Branch of the Department of Archaeology summarize the activities of the Branch during the decade when all publications non-essential for war purposes were banned.

THE best part of the period (1937–46) under review synchronized with the last world war and its aftermath, which paralyzed all peace-time activity. Indian epigraphy had also its share of the crippling effects of the war, though its progress was not hampered all too seriously. Village-to-village survey and collection of fresh epigraphs were carried on on a reduced scale, and the cumulative gain has in fact been more than could be expected under the circumstances.

The departmental publications having been suspended for the duration, it has not been possible to publish the results of our activities periodically as usual. And it might still take some time to get our detailed reports printed. It has therefore been thought expedient meanwhile to bring out a summary account for general information as to what was achieved in the field of Indian epigraphy during these ten years.

The total collection comprises upwards of four thousand inscriptions, those from South India being in predominant numbers as ever. The bulk naturally consists of records that are damaged, fragmentary, or comparatively unimportant. Of the rest, the most outstanding ones are noticed below. They cover a very wide range and add a great deal to our knowledge of Indian history. A couple of them even usher in some royal families that were hitherto unknown.

Some of the important epigraphs discovered earlier in the decade have already been published in the *Epigraphia Indica* and *Epigraphia Indo-Moslemica*, while some others have been dealt with in other periodicals. These, with a few exceptions, have been excluded from this account.

For the sake of convenience, a chronological order has, as far as possible, been adhered to, the entire material being divided into four groups: copper-plate inscriptions, stone inscriptions, miscellaneous inscriptions, and Muslim inscriptions.

I. COPPER-PLATE INSCRIPTIONS

Two sets of copper-plates (pls. XIX-XX) discovered at Kānukollu in the Kṛishṇā District and belonging to the Śālaṅkāyana dynasty are of outstanding importance. The earlier of the two records refers itself to the reign of Nandivarman. Its script is Brāhmī or the southern alphabet of about the fourth century A.D. The inscription is composed in Prakrit, except for two customary verses towards the end, which are in Sanskrit. It is issued from Vēṅgīpura and registers the grant of the village Piḍiha by Mahārāja Nandivarman, evidently of the Śālaṅkāyana dynasty, to the Chāturvaidya community of the Rathakāra *agrahāra*. The record is dated the 1st day in the 2nd fortnight of the rainy season in the 14th year, presumably of the donor's reign. By the pious gift, the royal donor wishes to ensure longevity and prosperity not only for himself, but also for his grandson Skandavarman who was then a mere child, *bālaka-mahārājakumāra-Khaṁda-pōttassa*. The next charter pertains to this very Skandavarman. It is written entirely in the Sanskrit language and contains the

following genealogy of the Sālaṅkāyana rulers: Hastivarman (I)—his son Nandivarman—his son Hastivarman (II)—his son Skandavarman. They are all styled Mahārāja. The last one is stated to be a devotee of the Lord Chitrarathasvāmin. This document is also issued from Vēṅgī. It records the gift of the village Kōmpara in the district of Kudrahāra by Skandavarman to the very Chāturvaidya community that figures as recipient in the foregoing charter too. The endowment was made on the 1st day of the bright fortnight of the month of Kārttika in the very 1st year of Skandavarman's reign. It is noteworthy that this charter brings to light the existence of two rulers of the name of Hastivarman in this family. Which of these two is identical with the Hastivarman of the Pedavēgi plates[1] is not certain.

The Wadgāon copper-plates of Vākāṭaka Pravarasēna II add one more charter to a number of similar records already discovered pertaining to this monarch. The present record is important for the geographical data it contains. It was issued from the royal camp on the bank of the river Hiraṇyā, the present Erai. It registers the grant of 400 *nivartanas* of land by Pravarasēna II to one Rudrārya of the Lauhitya *gōtra*, a resident of Ēkārjunaka, modern Arjuni. The land donated lay in the village Vēluaka, included in the Supratishṭha *āhāra*. Vēluaka, it is stated, was situated to the east of Gṛidhragrāma, to the south of Kadamasaraka, to the west of Nīlīgrāma and to the north of the road leading to Kōkilā. These can be identified with Gadeghāṭ, Kosara, Nīljai and Khairī respectively. The *āhāra* or sub-division of Supratishṭha comprised the modern Hinganghāṭ *tahsīl* and parts of the Warora and Yeotmal *tahsīls*.

A hitherto unknown line of kings, namely that of the Pāṇḍavas of Mēkala, is brought to light by a set of copper-plates found at Bamhanī in the Rewa State. No record of this dynasty is previously known. The lineage given in the present charter is as follows:—

1. Jayabala ;
2. Vatsarāja or Vatsēśvara (son of 1);
3. Nāgabala (son of 2 from Drōṇabhaṭṭārikā) ;
4. Bharata or Bharatabala (son of 3 from Indrabhaṭṭārikā ; married a princess of Kōsala, Lōkaprakāśā by name).

The object of the inscription is to register the grant of the village Vardhamānaka (to be identified with Bamhanī) in the district of Pañchagartā by Bharatabala to one Lōhitasarasvāmin of the Vatsa *gōtra*. The deed was issued on the 13th day of the dark fortnight in the month of Bhādrapada in the 2nd year of Bharatabala's reign. It was composed by Śiva, son of *Rāhasika* Īśāna, and engraved by Mihiraka, son of the goldsmith Īśvara. There is evidence enough to show that Bharatabala was a contemporary, and perhaps even a feudatory, of the Vākāṭaka monarch, Narēndrasēna (A.D. 435–70). The characters of the inscription are a perfect specimen of the nail-headed script of the fifth century A.D.

The Banaras plates of Śūravaṁśi Harirāja (pls. XXI-XXII), which provide yet another specimen of the nail-headed script of the fifth century A.D. are the first record so far known of the Sūra dynasty, about which very little is known even from the *Purāṇas*. The Śūra kings must have ruled in the vicinity of Banaras about this period. It is issued from Śāntanapura and records the grant of land, on a *Mahā-Kārttika-paurṇamāsī*, to one Sōmasvāmin of the Kauṇḍinya *gōtra*, who was proficient in the *Upanishads* (*samyag-upanishat-siddhāntavid*). Another remarkable thing about this record is that it was issued under the authority of the Council of Administration (*Mahāmātragaṇa*), consisting of several ministers whose names are mentioned in the charter. The ruling king Harirāja and his consort Anantamahādēvī

[1] *Journal of the Andhra Historical Research Society*, I (1926-7), p. 92.

are stated simply to have accorded their consent to the donation. Equally significant are the concluding words: *svastir=astu Mahāmātragaṇasya // dṛishṭam //* .

From Dhavaḷapēṭa in the Vizagapatam District come a set of plates of the reign of Mahārāja Umavarman. This charter is issued from Sunagara and registers the gift of the village Kuttupu in the Mahēndra *bhōga* by Mahārāja Umavarman to one Khallasvāmin. The donor was a ruler of Kaliṅga as may be inferred from the mention of the Mahēndra *bhōga*. The script of the inscription is the box-headed variety of the southern alphabet of about the fifth century A.D.

Welcome light on the little known history of the Nala dynasty which ruled in the southern parts of the Central Provinces and thereabout is thrown by the Kēsaribēḍa (Jeypore, Orissa) plates of Nala Arthapati of the fifth century A.D. The script of the present record is also the box-headed variety of the southern alphabet. It is issued from Pushkarī, evidently the capital of the Nalas. It registers the gift of the village Kēsēlaka (apparently the present Kēsaribēḍa) by Mahārāja Arthapati Bhaṭṭāraka to some Brāhmaṇas of the Kautsa *gōtra*. Arthapati is mentioned in the Rithapur plates of his father Bhava[da]ttavarman who had Nandivardhana as his capital.[1] It is noteworthy that the writer of the Rithapur plates, namely Chulla, figures as such also in the present record. Pushkarī is again mentioned in the Poḍāgaḍh stone inscription[2] which is ascribed to [Skanda]varman, supposed to be another son of Bhavadattavarman. Recently a hoard of gold coins of some Nala kings has come to light.[3] Some of them belong to Arthapati also. The combined evidence of the present charter and his gold coins show that he was an independent ruler.

Of the several copper-plate grants of the Pallava dynasty examined during the period, two are worth noticing here. One of them is the Neḍuṅgarāya (Nellore District) grant of Siṁhavarman. Issued from Palakkaḍa by Yuvamahārāja Vishṇugōpa, son of Skandavarman and grandson of Vīravarman, this charter records the gift of the village Neḍuṅgarāya in Muṇḍarāshṭra as *Śāraṇikagrāma* to several Brāhmaṇas. The inscription is dated the 13th day of the dark fortnight of the month of Jyēshṭha in the 12th year of the reign of the Pallava Mahārāja Siṁhavarman. The relationship of this Siṁhavarman to Yuvamahārāja Vishṇugōpa, the donor, is not known. He may be the elder brother of Vishṇugōpa as Fleet and Dubreuil have suggested while discussing his Uruvapalle grant.[4] The expression, *Śāraṇikagrāma*, which means 'a refugee-village', is noteworthy. The village was apparently created as a place where refugees could take shelter. In this connection, attention may be drawn to a corresponding Tamil expression *añjināṉpugaliḍam*, occurring in certain inscriptions of the Tamil country.

The other remarkable Pallava grant is the Nayadhīramaṅgalam (North Arcot District) grant of Nandivarman II Pallavamalla. It is issued in the 33rd year of his reign and introduces his general Avanichandra-yuvarāja, lord of Vilvalapura, at whose request the king granted the village of Nayadhīramaṅgalam to several Brāhmaṇas. We know of another general of this king, named Udayachandra, who was likewise styled the lord of Vilvalapura. Further, in an inscription of the 17th year of Dantivarman,[5] son and successor of Nandivarman II, mention is made of a certain Avanichandra, who may be identical with his namesake. From this it may be inferred that Avanichandra was a son of Udayachandra. A few more inscriptions of this dynasty which are engraved on stone are reviewed below in the section on stone inscriptions (p. 53).

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[1] *Epigraphia Indica*, XIX (1927-28), p. 100.

[2] Ibid., XXI (1931-32), p. 153.

[3] *Journal of the Numismatic Society of India*, I (1939), p. 29.

[4] *Indian Antiquary*, V (1876), p. 50.

[5] *South Indian Inscriptions*, IV (1924), no. 132.

Of the dynasty known as kings of Śarabhapura we have a copper-plate record of Mahāsudēvarāja. It was discovered at Kauvātāl in the Rāigarh District of the Central Provinces. It is issued from Śrīpura, and this is significant inasmuch as most of the hitherto known inscriptions of the dynasty are issued from Śarabhapura. It registers the grant of a village named Suṇikāyā of the [Ḍha]karī *bhōga* to one Bhaṭṭa Puraṁdarasvāmin of the Parāśara *gōtra*. In the present charter the name of Mahāsudēvarāja's father is given as Mahādurgarāja, whereas in some other records it is Mānamātra. This again is a noteworthy point. Possibly both the names refer to one and the same individual. The grant was made on the 10th day of Mārgaśīrsha in the 7th regnal year. It was engraved by one Gōlasiṁha. *Sarvādhikārādhikṛita Mahāsāmanta* Indrabalarāja acted as *dūtaka* to the grant. This individual is sought to be identified with Udayana's son Indrabala, father of the Sōmavaṁśi king Nanna of Mahākōsala.

Among the copper-plate grants of the Eastern Chālukya family two may be noticed in this paper. The earlier of them, obtained from the Collector of the Vizagapatam District, is issued from Kallūra *vāsaka* by Pṛithivī-Jayasiṁhavallabha I of the Eastern Chālukya family. The record is important for the data it affords for fixing the starting point of the chronology of this family. It is dated the 15th day of the 8th fortnight of the Hēmanta season, in the 18th year of the king's reign, when a lunar eclipse occurred. This regularly corresponds to the 13th February, A.D. 659, when there was a lunar eclipse. Thus the initial year of the king's reign was A.D. 641. His father and predecessor Kubja-Vishṇuvardhana is stated in the records of this dynasty to have had a reign of 18 years. Consequently, the starting-point of the Eastern Chālukya chronology, commencing with the rule of Kubja-Vishṇuvardhana, the founder of this line, would be A.D. 624. This would settle finally the controversy about the date of accession of Kubja-Vishṇuvardhana which had been fixed by Fleet long ago at *c.* 615 A.D.[1] and held the field so long.

The other Eastern Chālukya grant refers itself to the reign of Sarvalōkāśraya Vijayasiddhi (Maṅgi-Yuvarāja) and registers his gift of the village of Ēlūru (West Godāvarī District) in the Vēṅgi *vishaya* to one Śrīdharaśarman of Ayyavōlu, apparently the modern Aihoḷe in the Bījāpur District of the Bombay Province. This would show that the Eastern Chālukyas continued to patronize scholars hailing from their ancestral home. The gift was made in the 10th year of his reign on the occasion of the *annaprāśana* of his son, prince Vishṇuvardhana. The Chēvūru plates of Amma I[2] constitute another Eastern Chālukya grant of the present collection, and register a similar gift made likewise on the occasion of the *annaprāśana* of the donor's son Vijayāditya V.

The Kāṇḍyam (Vizagapatam District) plates, issued by a later ruler of this family, apparently Dānārṇava, register the bestowal of the governorship of the Pottapināḍu-300 division on Malliyarāja and Guṇḍiyarāja of the Mudugoṇḍa-Chālukya *vaṁśa*. References to this family are rare both in inscriptions and in literature. As the fourth plate containing particulars about the donor is mutilated, it is not possible to determine as to who the actual donor was. The part of the record containing the date is also broken, except that the words *dvinava* are preserved. Hence, we may not be wrong if we restore it to Śaka [8]92 (= A.D. 970) which falls within the reign of Dānārṇava.

Only one copper-plate inscription of the Western Chālukya dynasty is worth noticing here. It is engraved on a set of plates found at Shiggāon in the Dhārwar District of the Bombay Province. The record is issued by king Vijayāditya, in the Śaka year 630, from his victorious camp at Kisuvoḷal. In other records of this dynasty Raktapura is mentioned as the victorious camp and it has been identified with modern Lakshmesvar in the Miraj

[1] *Indian Antiquary*, XX (1891), p. 5.

[2] *Epigraphia Indica*, XXVII (1947-48), pp. 44ff.

State in Bombay-Karnatak. But Raktapura is plainly a Sanskrit rendering of the word Kisuvoḷal, *kisu* meaning 'red' and *voḷal-poḷal*, 'a town'. And as Kisuvoḷal is also stated to be a victorious camp in the present record, Raktapura has to be identified with modern Paṭṭadakal in the Bījāpur District of the Bombay Province. The inscription records certain gifts by the king to a *Jina-bhavana*, erected by the princess Kuṅkumadēvī. The grant is stated to have been made at the instance of the Āḷupa chief Chitravāhana at the time when the king visited Vanavāsī to meet the Āḷupa ruler. In a late eleventh century record the princess Kuṅkumadēvī is mentioned as a sister of king Vijayāditya. Her mention in a contemporary record like the present one is thus of great interest. It may be noted that this lady also figures in another record of this ruler.[1] Another inscription of the same king is on stone and its importance is discussed in the next section (below, p. 54).

Of the Chōḷas of Rēnāṇḍu, we have a copper-charter in the collection. It was found at Dommara-Nandyāla in the Cuddapah District and gives a full genealogy of the family down to Puṇyakumāra, who is given the title of 'Lord of Hiraṇyarāshṭra'. It is issued from the king's residence at Pudoṟūru in the 10th year of his reign on the full moon day of the month of Phālguna. The object of the grant was the gift of lands in the village of Nandigāma and Pasiṇḍikuṟu to some Brāhmaṇas. Palaeographically the record may be assigned to about the eighth century A.D. It may be noted that this is the second known copper-plate grant of this ruler.

The Salem (Salem District) plates of Western Gaṅga Śrīpurusha, dated Śaka 693, give a hitherto unknown genealogy, for three generations, of Śrīpurusha's daughter-in-law Kañchiabbā, wife of Duggamāra. The genealogy is as follows: King Nannappa—his son Śivarāja—his son Gōvindarāja (whose wife was Vinayavatī, daughter of king Vikramāditya) —his son Indarāja whose elder sister was Kañchiabbā. Two of these persons, viz. Śivarāja and his son Gōvindarāja appear to be identical with the Rāshṭrakūṭa princes of the same name figuring as subordinates of the Western Chālukya king Vikramāditya II in his Narwaṇ plates, dated Śaka 664.[2]

The Narasingapur plate and Jurerpur (Cuttack District) plate of Dēvānandadēva are a welcome addition. They belong to the Nanda dynasty of Orissa, two similar inscriptions of which are already known: Talmul plates of Dhruvānanda[3] and Bāripadā Museum plate of Dēvānanda.[4] The Narasingapur plate is damaged. Its inscription is shorter and the text faulty, but it settles the question of the exact name of the family; it is Nanda and not Nandōdbhava. Both the inscriptions mention the *maṇḍala* of Airāvaṭa, which occurs also in the two previously known records and has been located in the Cuttack District, the name having been identified with Raṭāgarh. The Jurerpur plate was issued from Jayapura, held to be identical with Jaipur in Dhenkānāl State.

The Chārāla (Chittoor District) plates of Vīra Rājēndradēva[5] are the only copper-plate record known so far of this king. Besides giving a complete account of the events of the king's reign up to his 7th year, it states that the Chōḷa king Vīra Rājēndra started on his expedition against the Western Chālukya king Ahavamalla (Sōmēśvara I) on the very day of his coronation and defeated him five times. One of these victories was won at the battle of Kūḍal Saṅgamam. The record is also important in that it helps to fill up the lacunae in the Kanyākumārī stone inscription of the same king[6] which is damaged in some portions.

1 *Annual Report on South Indian Epigraphy*, 1934-35, p. 57, para 8.
2 *Epigraphia Indica*, XXVII (1947-48), p. 125.
3 *Journal of the Bihar and Orissa Research Society*, XVI (1930), p. 457.
4 *Epigraphia Indica*, XXVI (1941-42), p. 74.
5 Ibid., XXV (1939-40), p. 241.
6 Ibid., XVIII (1925-26), p. 21.

Another noteworthy feature of the inscription is that it contains, besides the regnal year of the king, the Śaka year, a datum that is rare in the Chōḷa inscriptions of the period. The object of the grant is the gift of the village Chērām *alias* Madhurāntaka-Chaturvēdimaṅgalam in Pulināḍu to three Brāhmaṇas on the occasion of Uttarāyaṇa-saṅkramaṇa in the Śaka year 991, Saumya (= A.D. 1069). The Sanskrit *praśasti*, written in good *kāvya* style, is stated to have been composed by Chandrabhūshaṇa-Bhaṭṭa. The section on stone inscriptions contains some more important records of this dynasty (below, p. 56).

Of the Telugu Chōḍas of the later period a copper-plate record of Bhaktirāja was discovered at Peṇṭapāḍu in the West Godāvarī District. It is the second known copper-charter of this chief, the other being his Madras Museum plates.[1] The importance of the present record lies in the revelation that he owed his rise to the support of Prōlaya Nāyaka who is known to have rescued the Āndhra country from the hands of the Muhammadans in the fourteenth century A.D. We learn from it that Prōlaya Nāyaka was an associate of Vēṅga-Bhūpati, the maternal uncle of Bhaktirāja. Consequent on the death of Vēṅga-Bhūpati in the fight with the Muhammadans without leaving an heir to his kingdom, Prōlaya-Nāyaka installed Bhaktirāja as the ruler of his uncle's territory which seems to have comprised Vēṅgī and other tracts. Another point of interest in the record is the mention of Vīra Vōbi Nāyaka the son of Prōlaya Nāyaka, not known hitherto. This prince is stated to have been made the ruler of his father's kingdom by Kāpaya Nāyaka who is described as the paternal uncle's son (*pitṛivyasutaḥ*) of Prōlaya Nāyaka. The object of the present charter is the gift, by the king Bhaktirāja, of the village Peṇṭapāḍu in the Vēṅgī *vishaya* to several Brāhmaṇas. It bears the date Śaka 1265, Kārttika śu. 15, Thursday, the day of a lunar eclipse (= A.D. 1342, 13th November, Wednesday (not Thursday), when there was a lunar eclipse).

An interesting document of Prōlaya Nāyaka referred to in the charter noticed above comes from Vilasā in the East Godāvarī District. It is well-known that he was the cousin of the famous Kāpaya Nāyaka of the fourteenth century A.D., who re-established Hindu rule in Teliṅgāṇa after defeating the Muhammadans who had conquered it from the Kākatīyas. It gives a graphic description of the Muhammadan invasion of the Kākatīya kingdom and narrates the circumstances leading to the death of Pratāparudra, the last of the Kākatīyas. He died on the banks of the Sōmōdbhavā, i.e. Narmadā, while he was being taken to Delhi as a prisoner. This statement combined with the account of his death given in the Kaluvachēru grant of Anitalli[2] that he died of his own free will would indicate that he committed suicide by drowning himself in the river Narmadā, preferring death to ignominy.

Among the copper-plate inscriptions of the Gajapati kings of Kaliṅga examined during this period, the Chiruvrōlu grant of Haṁvīra is important inasmuch as it is the only record so far known of this prince. It is dated in Śaka 1383, Vṛisha, Bhādrapada ba. 15, Friday (= A.D. 1461, September 4, Friday) and registers the grant of the village Chiruvrōlu on the Kṛishṇā clubbed with Mēḷḷamirru, under the new name of Pratāpa-Haṁvīrapuram. It recounts the campaigns of his father Kapilēśvara against Hampā (i.e. Vijayanagara), Dhārā, Kalburga and Ḍhilli.

II. STONE INSCRIPTIONS

Of the stone inscriptions, the earliest in point of time is the Brāhmī inscription engraved on a boulder of a cavern at Māmaṇḍūr (North Arcot District) near Kāñchīpuram. It

[1] *Journal of Oriental Research*, V (1931), p. 128.
[2] *Bhāratī*, XXI (1931), part I, pp. 553–567.

appears to be written in the early Tamil language. As such, it adds one more to the series of early Tamil inscriptions written in Brāhmī characters in South India. As the characters of this inscription bear close similarity to those of the Arikamedu graffiti (see below, p. 57), its date may be very near to that of the latter which is considered to be of about the first century A.D.

Next in chronological order comes the Brāhmī inscription which is found engraved on the side of a cistern, till recently buried underground, in front of Cave No. II of the famous group of Buddhist caves at Kanheri near Bombay. It is in Prakrit and records the erection of the cistern by one Puṇarvasu, a merchant of Kalyāṇa. The Kanheri caves have already yielded quite a number of similar donative inscriptions.

The Mithouri pillar inscription (pl. XXIII) is another Buddhist record of the pre-Gupta period. It comes from a village called Mithouri in Rewa State. It is engraved on a stone pillar which originally served as shaft of a stone umbrella over a Buddha statue, as revealed by the concluding words of the inscription: *chhatraṁ pratishṭhāpayati*, etc. The record is dated in the year 80 of an unspecified era and refers itself to the reign of a hitherto unknown ruler Bhaṭṭāraka Mahārāja Vaṅgēśvara (?) Jāṅgata (?).

The Bandhogarh cave inscriptions are among the valuable discoveries which add to our knowledge of the history of Central India in the early centuries of the Christian era. Over a score of these inscriptions were copied in rock-cut caverns at Bandhogarh in the Rāmgarh *tahsīl* of Rewa State. The main group of inscriptions introduces three generations of kings of whom very little was known before. They are Mahārāja Vāsiṭhiputa siri Bhīmasēna (year 51), his son Mahārāja Kochchiputa Poṭhasiri (years 86 and 87) and his son Mahārāja Kosikiputa Bhaṭṭadēva or Bhadadēva (year 90). Of these only Mahārāja Bhīmasēna was known so far, from the painted inscription on the Ginja hill.[1] It can now be safely assumed that this Bhīmasēna is identical with the Bhīmasēna of the Bhīṭa seal,[2] as this also gives his metronymic Vāsiṭhiputa. These inscriptions record donations of several cave-dwellings and amenities like wells, gardens and *maṇḍapas*, near these dwellings. One of the records of Pōṭhasiri mentions his Minister of Foreign Affairs, named Māgha, son of the minister Chakōra. Another inscription of the 87th year of the reign of the same ruler mentions Pavata (Parvata) which is apparently identical with *Po-fa-to* noticed by the Chinese pilgrim Yuan Chwang. This is the earliest epigraphical reference to this place. Two more inscriptions found at Bandhogarh are of equally great interest. One of them is of Mahārāja Śivamagha of whose reign we have only one more inscription from Kosam (Kauśāmbī). The other is of the reign of Rājan Vaiśravaṇa who was the son of the Mahāsēnāpati Bhadrabala. The only other inscription known of him is that found at Kosam.[3] It may be noted, however, that in the latter Vaiśravaṇa calls himself Mahārāja but no mention is made of his father. *Mahāsēnāpati* of the Bandhogarh inscription may have been a title of nobility and need not be taken in the sense of an army-commander. It is just possible that Vaiśravaṇa who gained more eminence than his father, assumed at first the title of *Rājan* which was changed to *Mahārāja* when he became more powerful.

A Brāhmī inscription at Vēlpūru (Guntur District) is of some interest. It is in the Prakrit language and the characters are of about the second or third century A.D. It belongs to the reign of a king (name lost) who is called a Mahārāja and a Hāritīputa. The name of the family to which he belonged appears to be *Aira*. It may be noted that this family-name occurs in the inscriptions of Manchapurī and Hāthīgumphā caves in Orissa of about the same period.

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[1] Cunningham, *Arch. Surv. Ind. Rep.*, XXI (Calcutta, 1885), p. 119.

[2] *An. Rep., Arch. Surv. Ind.*, 1911-12 (Calcutta, 1915), p. 51.

[3] *Epigraphia Indica*, XXIV (1937-38), p. 146.

Five Prakrit inscriptions (pl. XXV) were discovered at the small village of Ghanṭasāla on the east coast, in the Kṛishṇā District of the Madras Province. They are all Buddhist donative records, incised on marble pillars, in Brāhmī characters of about A.D. 300. They resemble those found in greater numbers on other Buddhist sites in the neighbourhood, such as Amarāvatī, Jaggayyapēṭa and Nāgārjunikoṇḍa. One of the inscriptions mentions a sea-captain (*Mahānāvika*), Sivaka (Skt. Śivaka) by name, indicating thereby that the place was formerly a sea-port. In another, the place is mentioned under its ancient name of *Kaṁṭakasōla*. An article on these records is under publication in the *Epigraphia Indica* by Professor J. Ph. Vogel, who edited the Nāgārjunikoṇḍa inscriptions.

Another Brāhmī inscription was found at Gaṅgapērūru in the Cuddapah District. It is engraved on the broad side of a pillar broken both at the top and the bottom and shaped into an ellipse with its narrow ends flattened. Its language is Prakrit and characters are of the third to fourth century A.D. It refers to the *chhāyā-khabha* (sculptured memorial stone?) of an individual, named Śivadāsa who died in a fight on the occasion of a cattle-raid. The present is the first known Prakrit inscription in Brāhmī in the Cuddapah District. It may be added that there is a tradition that the Western Gaṅgas of Talakāḍ hailed originally from Gaṅga-Pērūru, the findspot of the inscription.

All the inscriptions so far discovered at the Buddhist site of Nāgārjunikoṇḍa (Guntur District) are in Prakrit. Recently, however, a couple of fragmentary Sanskrit inscriptions have come to light there. The extant portion of one of them speaks of a *dharmma-kathika*, 'religious preacher', whose name is lost. He is described as *śuddh-āchāra-vṛitta* and *āgama-vinay-ōpadēśa-prakaraṇ[āchā]ryya*. The script of the inscriptions is Brāhmī of about the fourth century A.D.

The Rewa State in which the Bandhogarh inscriptions noticed above were found has yielded yet another important record. It is engraved on a pillar at the village Supiā. It is dated in the Gupta year 141 and refers itself to the reign of the Gupta monarch Skandagupta. The genealogy given in the record begins with Ghaṭōtkacha. Curiously enough the family is referred to as Ghaṭōtkacha *vaṁśa*. This is perhaps the first record where so much importance is given to this member of the royal family. Another interesting feature of this inscription is that Chandragupta II is mentioned only by his surname, Vikramāditya, which is of common occurrence on his coins. The object of the inscription is to record the erection of the pillar by one Chhandaka, son of the banker Hari and grandson of the banker Kaivarta, a resident of Avaḍara.

An inscription of Pallava Sīhavammā was found in an ancient site at Manchikallu in the Guntur District, Madras Province. It is written in early Brāhmī characters of about the third century A.D. and in the Prakrit language. This mutilated record refers itself to the reign of Sīhavammā (Siṁhavarman) of the Palava (Pallava) dynasty and the Bhāradāya (Bhāradvāja) *gōtra* and mentions a *dēvakula* to which a gift seems to have been made. In point of palaeography this inscription appears to be earlier than the earliest Pallava records hitherto known, viz. the Mayidavōlu and Hirahaḍagalli plates of Śivaskandavarman.[1] Sīhavammā of the inscription under review must therefore be considered an earlier member of the dynasty. It is not unlikely that he is the same as Mahārāja Bappasāmi (*bappa* means 'father') of the Hirahaḍagalli record. It may be noted, however, that in the present stone inscription he does not bear any title indicative of suzerainty. Probably he was, at the time of this record, still a subordinate of the Ikshvākus who were then ruling over that part of the country and whose inscriptions are found in the neighbourhood.

An inscription of Pallava Siṁhavarman (pl. XXIV), in Pallava-Grantha characters of about the seventh century A.D. and written in the Sanskrit language, comes from Śivanvāyal,

[1] *Epigraphia Indica*, VI (1900-01), p. 84 ; I (1892), p. 5.

Chingleput District. It states that the Pallava king Siṁhavarman, described as the performer of the *Daśāśvamēdha* and *Bahusuvarṇa* sacrifices, made a gift (details lost). The palaeography of the inscription would suggest that this ruler was Narasiṁhavarman I, the conqueror of Vātāpi. If so, this would be the third known record of this king, the other two being those at Bādāmi (Bījāpur District) and Tirukkaḻukuṉṟam (Chingleput District).[1]

To Nṛipatuṅgavarman, a later member of this dynasty belongs the Maṭhavalam (Chittoor District) inscription. It is important in that it is dated in the 41st year of his reign, for the latest regnal year known for him so far is 26. The present record thus extends his reign by 15 years. This would help in re-considering the dates assigned to the later Pallava chiefs.

The earliest stone epigraph in Telugu language written in characters resembling the Pallava-Grantha comes from Tippalūru in the Cuddapah District. It refers itself to the reign of Puṇyakumāra whose dynasty is not specified. It registers a grant of *panāśa* at Tippalūru by the king to *pāradāya* (Bhāradvāja) Kiḷevura Kattiśarman of Tarkkapuḷōlu. The king is here given the titles *Madamudita*, *Maruṉṟa-piḍuku*, etc. which bear a close similarity to the *birudas* of some of the early Chōḷa kings of Rēnāṇḍu.

From Mācherla in the Palnad *taluk* (Guntur District) comes an inscription of the Eastern Chālukya king Jayasiṁhavallabha (II). It is dated in the 8th year (*c*. A.D. 714) and records a gift of land to the god Arahanta-Bhaṭāra by certain officers of Paḷḷināṇḍu. It is noteworthy that as early as the eighth century A.D. this region of Palnāḍu was called Paḷḷināṇḍu. Several views have been put forward regarding the derivation of the geographical name Palnāḍu. The form Paḷḷināṇḍu is composed of the words *paḷḷi* and *nāṇḍu*. In Tamil *paḷḷi* means 'a Buddhist or Jaina settlement' in which sense it appears to have been used in the present inscription. As for *nāṇḍu* (or *nāḍu*), it obviously stands for a territorial division in all the Dravidian languages. This derivation is supported by the fact that in olden days the Palnāḍu region actually abounded in Buddhist and Jaina settlements whose ruins lie scattered in the region to this day.

A Kannaḍa inscription of the reign of the Western Chāḷukya king Vijayāditya deserves special mention on account of its value for reconstructing the later Pallava chronology. It was found in Uḷchaḷa in the Kurnool District. It is dated in the 35th year of the king's reign corresponding to A.D. 730-1. We learn from it that Yuvarāja Vikramāditya (II) while returning after conquering Kāñchī and levying tribute from the Pallava king Paramēśvara made a gift of the villages Uḷchaḷu and Pariyaḷu to Durvinīt-Ereyappa of the Koṅguṇi (i.e. Western Gaṅga) family. Vikramāditya II, as specifically stated in the Vakkalēri and Kendūr plates of his son, Kīrtivarman II, after his accession to the throne, defeated the Pallava king Nandipōtavarman. The Uḷchaḷa record gives us the additional information that even at the time when he was Yuvarāja he had once defeated the Pallava king Paramēśvara, who is evidently Paramēśvaravarman II, the predecessor of Nandivarman. It follows therefore that at the time of this record, namely A.D. 730-1, the contemporary Pallava ruler was Paramēśvaravarman II and that Nandivarman II had not yet come to the throne. Hence the starting-point of the later Pallava chronology beginning with the reign of Nandivarman II has to be placed subsequent to A.D. 730-1.

An inscription of Jayasiṁha II of the later Chālukyas who had their capital at Kalyāṇi is preserved in the Hyderabad Museum. It is dated Śaka 949, Prabhava (= A.D. 1027), and mentions Sōmaladēvī, a hitherto unknown daughter of Jayasiṁha II. We already know of another daughter of this king named Āvalladēvī, the queen of the Yādava prince Bhillama III. Sōmaladēvī is stated to have made a grant to a *basadi* at Piriya-Mosaṅgi (modern Māski). The grant was made when the princess was camping at Pulipodaṟu.

[1] *South Indian Inscriptions*, XI, pt. I (1940), p. 1 ; XII (1943), p. 9.

Three records of the Rāshṭrakūṭas of Malkhed may be reviewed here. The first is the Arshinaguppi (Dhārwar District) inscription of Amōghavarsha, dated Śaka 781, which mentions the place-name Kiṟuguppudūr. Now, the name of the village granted in a copper-plate inscription of Kadamba Kṛishṇavarman II[1] is Kiṟukupputūr, which may as well be read as Kiṟuguppuḍūr. This has been identified with Kubṭūr in the Shimoga District of the Mysore State. But the mention of Kiruguppaḍūr in the present stone record helps us to identify the Kiṟuguppudūr of the Kadamba plates with modern Arshinaguppi in the Hāngal *taluk* of the Dhārwar District.

The second Rāshṭrakūṭa record is the Kamalāpuram (Cuddapah District) inscription of Indra III which is noteworthy as it helps in carrying forward the reign of this king to at least the end of A.D. 925. Till recently the last date of Indra III was taken to be A.D. 917 on the basis of the Danḍāpur record of his successor Gōvinda IV, dated Śaka 840 (= A.D. 918).[2] Records later than this date mentioning the king merely by the title of Nityavarsha were considered to belong to the reign of Gōvinda IV, on the assumption that both Indra III and Gōvinda IV had this title. But the record under review, referring itself to the reign of Nityavarsha Indranarēndra and dated Śaka 848, Pārthiva, establishes definitely that Indra continued to rule till at least A.D. 925 and that the Danḍāpur record should be considered to have been issued by Gōvinda in his capacity as Yuvarāja. It may be observed in passing that a record of the reign of Nityavarsha from Haḷeritti, Dhārwar District of the Bombay Province, is dated Śaka 850 (= A.D. 927) and thus extends his reign by two more years, i.e. up to A.D. 927.

The Hulgūr (Dhārwar District) record of Khoṭṭiga (pl. XXVI) is the third record of the Rāshṭrakūṭa dynasty. It is in Kannaḍa and is issued in Śaka 893, Śukla (= A.D. 971). It records a gift by Abbarasi, wife of the Gaṅga chief, Guttiya-Gaṅga, i.e. Mārasiṁha II. She is stated to be the daughter of a certain Dānapa (*Dānapātmaje*). Abbarasi was not known so far either from literary or epigraphical sources. Dānapa, her father, cannot now be identified. It may, however, be noted that the Eastern Chālukya king, Dānārṇava (A.D. 970–973) who was a contemporary of Mārasiṁha II, was also known by the names of Dānapa and Dānapēśa.

Of the reign of Veṅkaya-Chōḷa Mahārāja, a scion of the family known to historians as the Telugu-Chōḍas, we have an inscription at Doṅgalasāni in the Cuddapah District. It is dated in the 41st regnal year of the king and is written in Telugu characters of the ninth to tenth century A.D. Among the members of this dynasty, this is the earliest chief to bear the epithet Teṅkaṇāditya, two of the later members who bore this epithet being Nannichōḍa, the author of the Telugu work *Kumārasambhavam*, and Oppili-Siddhi II who was a contemporary and probably a subordinate of Kākatīya Gaṇapati.

An inscription at Vēmulavāḍa in the Nizam's Dominions is of the reign of Baddega of the little known family of the Chālukyas of Vēmulavāḍa. It consists of two Sanskrit verses and records the construction of a *Jinālaya* by Baddega for Sōmadēvasūri of the Gauḍa *saṁgha*. Baddega is stated to be the fifth in descent from Yuddhamalla, the ruler of Sapādalaksha country. Sōmadēvasūri of the record is evidently identical with the author of *Yaśastilakachampū*, in the colophon of which it is stated that his patron was Vaddega, son of Arikēsarin of the Chālukya family.

Two Pāṇḍya records from Śālaigram (Ramnad District), written in Vaṭṭeḻuttu characters of the tenth century A.D., are engraved on the door-jambs of the temple of Varaguṇa-Īśvara at the place. One of them is dated in the 2nd+1st (3rd) year of the reign of the Pāṇḍya king Kōch-Chaḍaiya-Māṟar and the other is of the 15th+5th (20th) year of the reign of

[1] *Digest of Annual Report of Kannada Research in Bombay Province*, 1940-41 (1945), p. 366.

[2] *Indian Antiquary*, XII (1883), p. 222.

Śōlanralaikoṇḍa Vīra-Pāṇḍyar, i.e. Vīra-Pāṇḍya 'who took the head of the Chōḷa'. As the characters of both the records resemble each other very closely, it is probable that they were caused to be incised by the two kings who were not far removed from each other in point of time.

In the Sundarēśvara temple at Madurā were found two Tamil inscriptions of Pāṇḍya Kulaśēkhara which register gifts of land as *jīvita-kāṇi* to the musicians belonging to the temple. One of the musicians who is given the title of *Vallāṇai-Veṇra-Pāṇḍya-Vādyamārāyaṇ* (= the chief-master of instrumental music to the king Vallāṇai-Veṇra-Pāṇḍya) is apparently the royal musician. In the other inscription are mentioned the following musical instruments: (1) *vīra-maddaḷam*, (2) *maddaḷam*, (3) *timilai*, (4) *śēmakkalam*, (5) *kāśai*, and (6) *tiruchchiṇṇam*. These records are assignable to the thirteenth century A.D.

Śrīraṅgam (Tiruchirappalli District) inscription of Chōḷa Kulōttuṅga I is a Kannaḍa record, dated in the 29th year of Kulōttuṅga I. It records a gift for lamps by an officer bearing the titles of *Kannaḍa-sandhi-vigrahi* and *Daṇḍanāyaka* of the Western Chālukya king Vikramāditya VI. The inscription seems to throw light on the friendly relations that existed between the two great dynasties, once hostile, the Chōḷas and the Chālukyas, towards the end of the eleventh century A.D. Another inscription of the same Chōḷa ruler in Telugu is at Guḍimūla in the West Godāvarī District. It gives the name of the king as Sarvalōkāśraya Vishṇuvardhana Mahārāja and is dated Śaka 1017 (= A.D. 1095-6) in the 35th year of the king's reign. The date cited here would show that the king counted his regnal years from A.D. 1061, which is known to be the last date of his father Rājarāja who ruled at Vēṅgī. This fact is important since it is held that Vijayāditya VII, the paternal uncle of Kulōttuṅga I, seized the throne of Vēṅgī at the time of his brother's death and placed his son Śaktivarman on it. The present record, on the other hand, would show that Kulōttuṅga I succeeded his father on the throne of Vēṅgī in A.D. 1061, thus disproving the view that Śaktivarman usurped the throne.

The Kōni (Bilāspur District) inscription of Kalachuri Pṛithvīdēva II is a long *praśasti*, dated in the Chēdi year 900 (= A.D. 1148-9). The village of Kōni is near Bilāspur in the Central Provinces. The inscription records the erection of a Śiva temple, *Śivapañchāyatana*, by a Brāhmaṇa called Purushōttama, who is credited with many other similar religious acts. It also registers the grant of the village Salōnī to the said Brāhmaṇa by the Kalachuri king Pṛithvīdēva II.

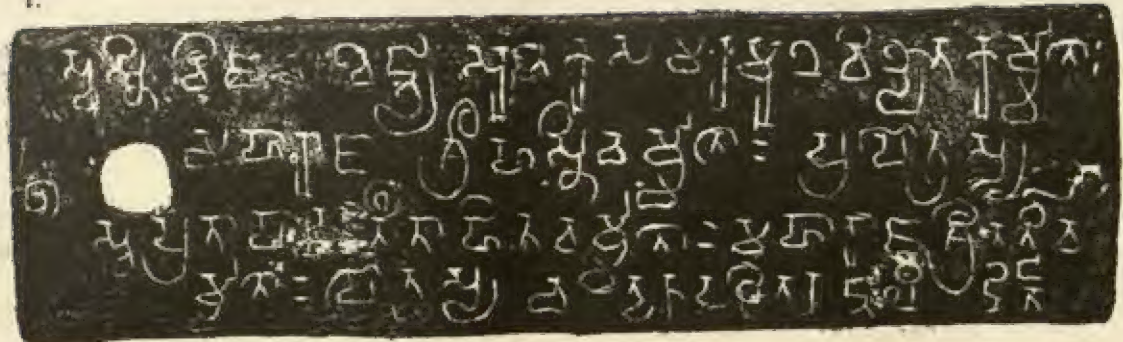
One record of Yādava Siṅghaṇa dated Śaka 1156 was copied at Mantravāḍi in the Dhārwar District of the Bombay Province. It is important as it provides the earliest epigraphical reference to the *vachana* or saying of the famous Liṅgāyat saint Siddha-Rāmanāthadēva.

An inscription from Chingleput District of the time of Vijaya-Gaṇḍagōpāla, a king of Kāñchī (*c.* A.D. 1250), gives the interesting information that Karikāla-Chōḷa settled at Mayilāppūr 70 families including that of Ēlēlasiṅgaṇ. Ēlēlasiṅgaṇ's association with Mayilāppūr is noteworthy as he is known to have been the merchant friend of Tiruvaḷḷuvar, also of Mayilāppūr, author of the famous Tamil classic, the *Kuṛaḷ*.

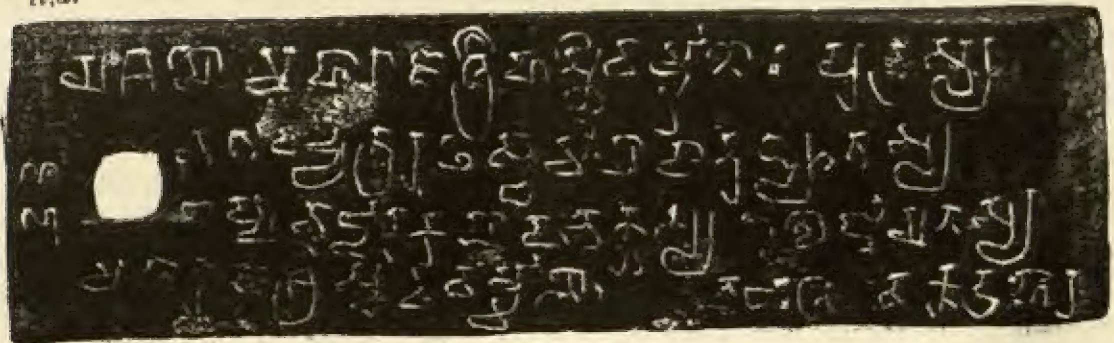
A Hoysaḷa record from the Tiruchirappalli District, of the 19th year of Rāmanāthadēva (= A.D. 1273-74) states that a goldsmith made a gift of a forehead-plate to the god of the village Peruṅguḍi (Tiruchirappalli District) in gratitude for the restoration of the eye-sight of his son who had lost it while he was young.

The interest evinced in the formation and maintenance of libraries by philanthropic persons is revealed in the Śrīraṅgam (Tiruchirappalli District) inscription of Pāḷappaḷḷi Nīlakaṇṭha Nāyakar. It records the founding of a library in the *maṇḍapa* of the Raṅganāthasvāmin temple at Śrīraṅgam by the chief. From another inscription at Jambukēśvaram near Śrīraṅgam, this chief is known to have flourished in the fourteenth year of the

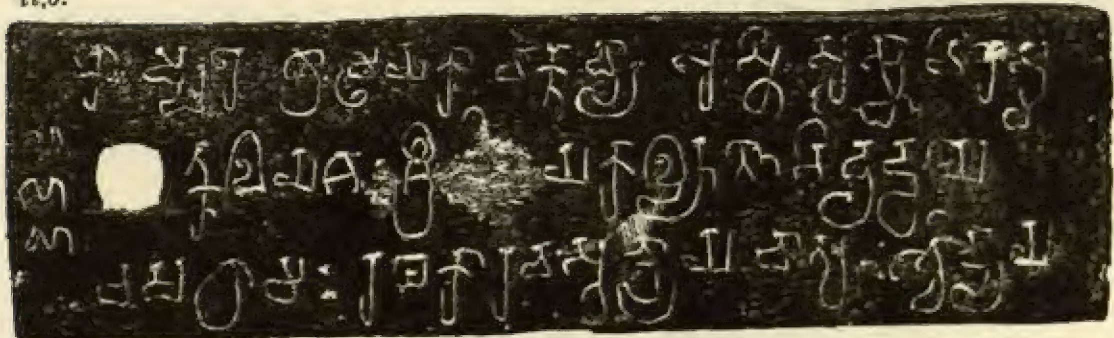
i.



ii,a.



ii,b.



Kanukollu plates of Śālaṅkāyana Skandavarman. Scale ½

iii,a.

iii,b.

iv.

Same as plate XIX

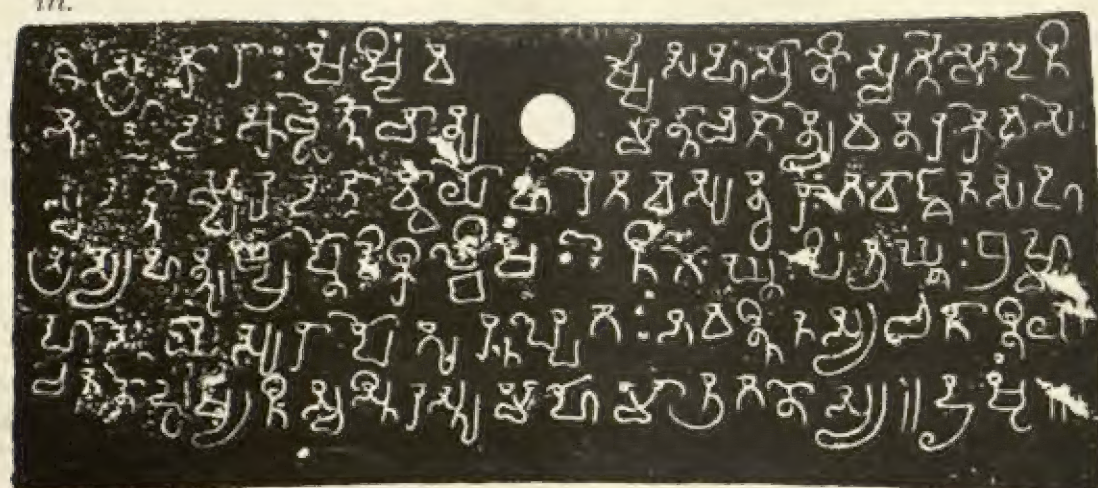
i.

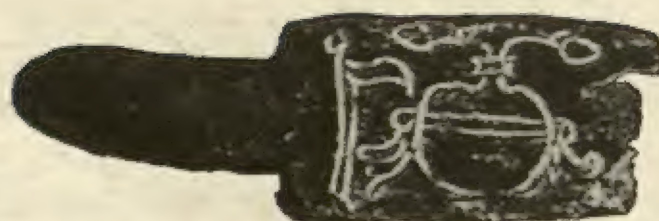
ii,a.

ii,b.

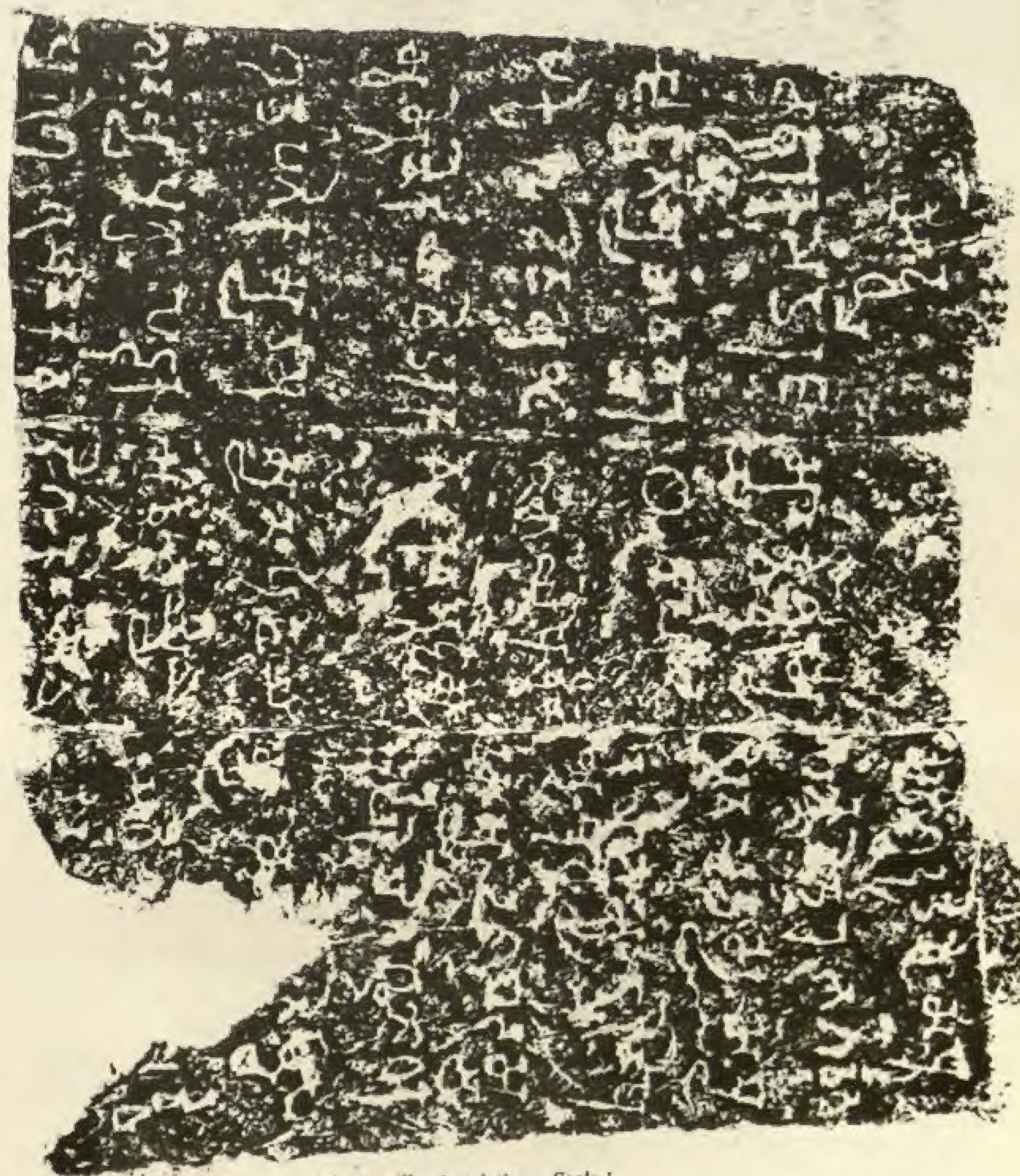
Banaras plates of Harirāja. Scale ½

iii.





Same as plate XXI



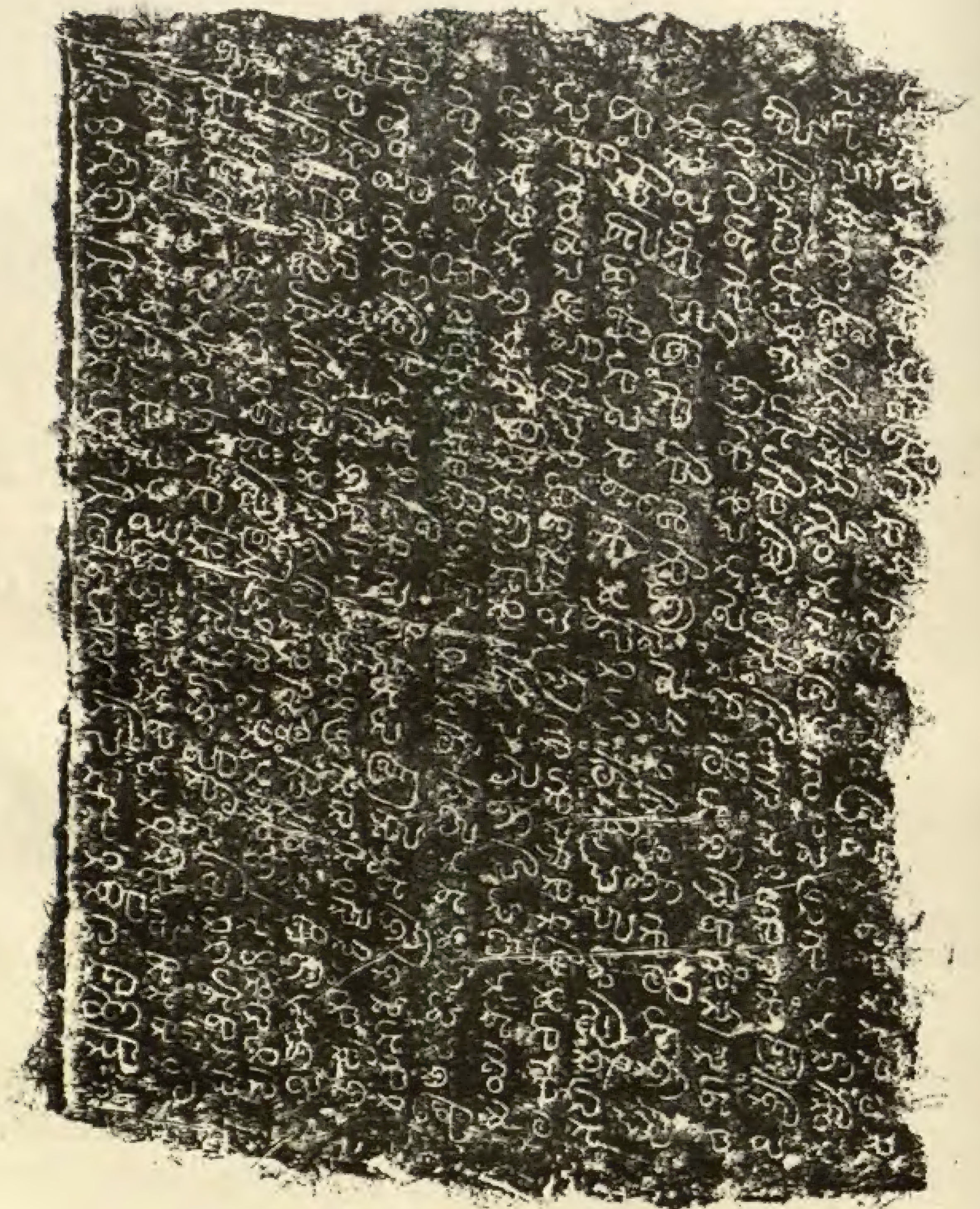
Mithouri pillar inscription. Scale ½



Śivanvāyal inscription of Pallava Narasiṁhavarman I (first side). Scale ¼



Ghaṇṭasālā Prākrit inscription. Scale ⅔



Hulgur plate of Rāshṭrakūṭa Khoṭṭiga. Scale ¼

reign of the Hoysaḷa king Vīra-Rāmanātha (= A.D. 1268). The inscription also mentions the installation, in that very *maṇḍapa*, of the images of Hayagrīva, Sarasvatī and Vyāsa-bhagavān, the presiding deities of learning, by the same person. It is thus noteworthy that inscriptional evidence to the existence of libraries in prominent temples, as laid down in the *Āgamas*, is found as early as the thirteenth century A.D.

Another inscription from Śrīraṅgam written in Grantha script and Telugu language is of the time of Kākatīya Pratāparudradēva and is dated in Śaka 1239. It states that the king's commander Dēvari Nāyaka marched with an army to the south against the five Pāṇḍyas, defeated Vīra-Pāṇḍya and the Malayāḷa Tiruvadi Kulaśēkhara at Tiruvadikuṉṟam and established Sundara-Pāṇḍya at Vīradhāvaḷam. The inscription is important in that it reveals the part played by the Kākatīya king in the internecine wars among the Pāṇḍyas and in establishing Sundara-Pāṇḍya at Vīradhāvaḷam.

The benefactions of the Vijayanagara king, Virūpāksha II (fourteenth century A.D.) to the principal deity of Śrīraṅgam, are recorded in two Sanskrit verses engraved on one of the walls of the temple at the place. The first of these is the same as the opening verse in the drama *Nārāyaṇīvilāsa* in which the *sūtradhāra* introduces king Virūpāksha as the author of that play. As this verse is apparently copied from the drama it may be surmised that the king took keen interest in popularizing his composition.

That the raids of the Gajapatis of Orissa in the south extended as far as Śrīraṅgam is borne out by the Śrīraṅgam inscription of Gajapati Hambīra Mahāpātra. As no inscriptions of this family are found further south it may be taken that Śrīraṅgam was the utmost limit of their incursions into the south. The record is dated Śaka 1386, Subhānu (= A.D. 1464), and states that this chief endowed the Śrīraṅgam temple with a gift of cows.

From Rāmgaḍh in the Sandur State (Bellary District) comes an inscription mentioning Kumāra-Rāmanātha, the hero of the Kannaḍa poems *Kumāra-Rāmanāthana-Sāṅgatya* and *Paradāra-sōdara-Rāmana-Charite*. It is dated Śaka 1450 in the reign of the Vijayanagara king Kṛishṇadēvarāya and records the construction of a temple for the deity Rāmanāthadēva at Hosamaleyadurga in memory of Vīra-Rāmanātha Oḍeya of Hosamale and other heroes who fell in battle along with him. Rāmanātha Oḍeya is stated to be the son of Khaṇḍērāya Kampilarāya and Vīra-Gujjala Hariharadēvī and grandson of Mummaḍi Siṅgaṇa. This record, though removed in point of time by about two centuries from the time of Rāmanātha Oḍeya, is interesting inasmuch as it reveals the love and esteem with which this hero's memory was cherished for generations. Rāmanātha Oḍeya was famous as Kumāra-Rāma who valiantly fought against the Muslims just prior to the foundation of the Vijayanagara kingdom. The inscription affords epigraphical confirmation to the account found in the Kannaḍa literary works mentioned above that he was the son of Kampilarāya. The place Hosamale, where the temple was erected in memory of Rāmanātha, is evidently the present Rāmgaḍh, formerly known as Rāmanmalai (Sandur State, Madras Presidency), the findspot of the inscription. It may be noted that Rāmgaḍh contains traces of a fortification.

A *Nishidhi* inscription from Sonda (North Kanara District) records the death of the Jaina teacher Bhaṭṭākalaṁkadēva who may be identified with the famous author of the Sanskrit grammar of the Kannaḍa language. It is dated Śaka 1577.

III. MISCELLANEOUS INSCRIPTIONS

Twenty potsherds discovered in the excavations at Arikamedu near Pondicherry (South India) bear graffiti. Though brief and mostly fragmentary, they are very important inasmuch as they supply specimens of the ancient Drāviḍī script, allied to Brāhmī, as also

of the earliest writing in the Tamil language. A detailed and illustrated account of them has already been presented in *Ancient India*, no. 2 (July, 1946), pp. 109–114.

Twenty-four potsherds from the Peshawar Museum were examined and found to contain portions of short dedicatory records of names in Kharōshṭhī characters of about A.D. 200. Only in one case the writing is engraved, while in the rest it is painted in black. The engraved one reads *Budhamitrasa*, 'of Budhamitra', and seems to be a complete record.

From Sunet in the Ludhiāna District of the Punjab came a collection of twenty-eight terracotta sealings, mostly containing personal names like Śaṅkaranārāyaṇa, Vishṇudāsa, etc., in the Gupta script assignable to *c.* fifth century A.D.

A copper tray was received from the Rajasaheb of Jamkhandi State in the Bombay Province, bearing an inscription in Hebrew on its inner side. It gives a descriptive account of the history of Solomon's throne and greatness.

IV. MUSLIM INSCRIPTIONS

During the decade under review about 200 inscriptions were collected, of which the important ones refer to the Sulṭāns of Delhi, Bengal, Gujarat and Mālwā; the Niẓām Sh̲āhs of Ahmadnagar; the 'Ādil Sh̲āhs of Bījāpur; the Baihmanīs of Gulbarga; the Barīd Sh̲āhs of Bidar; the Quṭb Sh̲āhs of Golconda; and the Mughul emperors of India. They mostly deal with political, economic and religious history of the Muslim period and also shed some light on important personages otherwise unknown to history. Some of them are very interesting both from the palaeographic and historic points of view inasmuch as they represent exquisite styles of *Naskh̲*, *Th̲ulth̲* and *Nasta'līq*, give new regal titles of kings and even correct dates known from other sources. The more important of them are briefly noticed below in chronological order.

Mathurā, although plentifully rich in remains of the early Buddhist and Brahmanical periods, was commonly believed to possess no Muslim building of pre-Mughul time.[1] An old Persian inscription, in verse, discovered in the tomb of Makh̲dūm Sh̲āh Walāyat at Mathurā, however, refers to a Muslim structure built at Mathurā long before the reign of Akbar. It is unfortunately only fragmentary and the event referred to therein is not clear. Nevertheless, it mentions Sultān 'Alāu'd-Dīn Kh̲aljī with his title 'Sikandar-i-Th̲ānī' (Alexander II), Gujarat and the mosque of Ulugh̲ Kh̲ān. Since 'Alāu'd-Dīn Kh̲aljī's brother, Almās Beg, entitled Ulugh̲ Kh̲ān, was deputed to conquer Gujarat[2] in A.H. 697 (A.D. 1297-98), it is reasonably inferred that the record alludes to the Gujarat expedition and the erection of a mosque at Mathurā by that noble. Also, early Muslim inscriptions in India are generally in prose and rarely in verse; hence the importance of the epigraph under notice.

Sulṭān Sh̲amsu'd-Dīn Ilyās Sh̲āh of Bengal was the first independent king of Bengal, but his chroniclers are at variance about the exact year of his accession. Gh̲ulām Ḥusain, author of the *Riāẓu's-Salāṭīn*, and Charles Stewart, author of the *History of Bengal* (London, 1813), maintain that he became king in A.H. 746 (A.D. 1345-46), while others are inclined to place his accession about A.H. 740 (A.D. 1339-40) on numismatic evidence. But the recent discovery of an Arabic inscription in the neighbourhood of Calcutta, mentioning the construction of a mosque in A.H. 743 (A.D. 1342-43) for a saint, named 'Alāu'l-Ḥaq,

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[1] F. S. Growse, *Mathura: A District Memoir*, 3rd ed. (Allahabad, 1883), pp. 33-34.

[2] Ziāu'd-Dīn Baranī, *Tārīkh̲-i-Fīrūz Sh̲āhī*, Persian text (Bibliotheca Indica, Calcutta, 1862), p. 251; *Tārīkh̲-i-Firish̲ta*, Persian text (Nawal Kishor Press, Lucknow, 1905), I, pp. 102-03.

in the reign of Sulṭān Ilyās Shāh, conclusively contradicts the date given by Ghulām Ḥusain and Stewart and tends to support the other view.

A Persian inscription from Bheṭ Dwārkā, a small island in the vicinity of Okha Port in Kāthiāwāḍ, records the erection of a mosque in the reign of Sulṭān Fīrūz Shāh Tughluq of Delhi in A.H. 777 (A.D. 1375-76) at the instance of Shamsu'd-Dīn Dāmaghānī. It obviously corrects the date of Dāmaghānī's appointment as Governor of Gujarat which, according to the *Tārīkh-i-Firishta*,[1] was A.H. 778 (A.D. 1376–77), or a year later.

An inscribed slab, found lying at Holsingī in the Indi Taluqa of the Bījāpur District, deserves notice. Although undated, it bears the words 'the boundary of Sulṭān 'Alāu'd-Dīn Aḥmad Shāh' and is rightly supposed to have served as a boundary-mark of that king. Its historical significance lies in the facts that it establishes the tradition of the Muslim rulers of India to fix stone slabs carved with their names on the boundary of their territories and that Bījāpur formed part of the Baihmanī kingdom in the reign of 'Alāu'd-Dīn Aḥmad Shāh II (A.H. 839–62 = A.D. 1435–57).

An interesting stone record of the time of Ghayāth Shāh Khaljī of Mālwā (A.H. 880–906 = A.D. 1475–1500) has been recently discovered near the main gate of the Bhonrāsa Fort in the Gwalior State. The inscription is bilingual—Persian and Hindī—and contains a royal mandate sanctioning relief to his subjects in the form of remission of some taxes including the *jizya* and revival of usual worship, forbidding the slaughter of cows declared here as a 'sin', and preventing acts of vandalism possibly in respect of some temple. The inscription is fragmentary but sheds some light on the relations of the ruler and the ruled during the sovereignty of the Muslim rulers of Mālwā.

Briggs, in his English translation of the *Tārīkh-i-Firishta*,[2] gives A.H. 914 (A.D. 1508-09), in the reign of Maḥmūd Shāh Bīgaṛha of Gujarat, as the date of completion of the Jāmi' Masjid at Chāmpāner in the Pānch Mahal District of the Bombay Province. In support of this he quotes three Persian couplets of a contemporary poet, the last hemistich of which contains the chronogram *Khuṭba-wa-mimbar* (lit. sermon and pulpit) yielding A.H. 914. Eminent modern scholars have accepted his views.[3] But a Persian epigraph, in verse, above the minor *miḥrāb* of the Jāmi' Masjid, which so far passed for a Qurānic verse on account of its intricately interlaced letters of the *Thulth* style of Arabic script, clearly records the completion of the mosque in A.H. 924 (A.D. 1524), or ten years later, in the reign of Muẓaffar Shāh II, the son and successor of Maḥmūd Shāh Bīgaṛha. This epigraph settles once and for all the date of completion of the mosque, while the date A.H. 914, hitherto accepted on the authority of Briggs, may now be considered to relate to the installation of the pulpit in the elaborately ornamented central *miḥrāb* with a view to starting religious service in the mosque as early as possible pending the completion of other parts of the building.

In the historical city of Fatehpur Sīkrī, where Bābur staked his all on the bloody battle against Rāṇā Sāngā in A.D. 1527 and gave Sīkrī a new appellation 'Shukrī' ('Thanksgiving') to commemorate his hard-won victory over the Rāṇā,[4] no monument of that Emperor's time was so far identified with certainty. But a much worn-out inscription in *Thulth* characters, recently discovered from the steening of a well in an out-of-the-way

[1] Briggs, *Tārīkh-i-Firishta*, English translation (London, 1829), I, pp. 455-56.

[2] Ibid., IV, p. 70.

[3] J. Burgess, *Muhammadan Architecture in Gujarat*, II (Arch. Surv. Ind., New Imperial Series, XXIII, London, 1896), p. 42; *Gazetteer of the Bombay Presidency* (Bombay, 1879), III, p. 309; *Cambridge History of India* (Cambridge, 1928), III, pp. 612-13.

[4] *Akbarnāma*, Persian text (Calcutta, 1877), I, p. 105.

place near the Ajmerī Gate, helps to assign the construction of the well to Bābur in A.H. 933 (A.D. 1527) on his return from the battle against Rāṇā Sāngā.

Near the Takya Masjid at Dīdwāna in the Jodhpur State stands a pillar which is the only remnant of a majestic gateway that existed there in the past. To it is fixed a marble slab bearing a Persian inscription in verse composed by the eminent poet, Ni'matu'llāh Rasūlī of Akbar's reign, and calligraphed in *Nasta'līq* style by one Jān Muḥammad. The epigraph is chronogrammatic, yielding A.H. 1000 (A.D. 1591-92), and contains 'Abu'l-Ghāzī' as the *Kunniyat* of Emperor Akbar instead of his usual epithet 'Abu'l-Fatḥ'.

In the Khānqāh of Ḥazrat Tārikīn at Nagaur in the Jodhpur State there are four Persian inscriptions in *Nasta'līq* letters in relief concerning Mīr Muḥammad Ma'ṣūm Nāmī, a well-known inscription-writer of Akbar's reign. One of them is written by Nāmī and the rest by his son, Mīr Buzurg, who, like his father, was a good calligraphist. Of these, two are of sufficient historical value. Nāmī's own epigraph speaks of his deputation to 'Irāq in A.H. 1010 (A.D. 1601-02) as a حاجب (Chamberlain or Minister), a fact not traceable in contemporary records. The other inscription by Mīr Buzurg mentions Nāmī's compilation of a collection of five poems, entitled *Khamsah*, from which specimens of verses have been quoted, and also records Nāmī's return from the embassy to Īrān in 1013 A.H. (A.D. 1604) corroborating the date given in the *Akbarnāma*.[1]

Two inscriptions, one in Persian and the other in Marāṭhī, have been discovered from a well at Āshtūr in Bidar assigning the construction of the well to a royal officer, named Jagapat Rāo, during the reign of Mīrzā Walī Amīr Barīd Shāh at Bidar in 1018 A.H. There is a difference of opinion among the historians about the title of this king: according to Haig,[2] 'Alī Barīd Shāh was the title of the last king of Bidar who ruled from A.H. 1018 (A.D. 1609-10), whereas the *Tārīkh-i-Firishta* and the *Basātīnu's-Salāṭīn* are united in calling him as 'Mīrzā Walī Amīr Barīd Shāh' and the latter view is supported by these two epigraphs which are also beautiful specimens of *Thulth* style of writing so highly prized in the sixteenth and seventeenth centuries. It is also interesting to note that Marāṭhā officers wielded much influence at the court of the Barīdī kings of Bidar with the result that there had been extensive use of Marāṭhī in official documents and epigraphical records of that period.

Two inscriptions dated A.H. 1045 (A.D. 1636) and one dated 1046 A.H. (A.D. 1636) have been found engraved on rocks in the ancient Sātmālā hill-forts in the Nāsik District of the Bombay Province. They contain the names of fourteen hill-forts built by Niẓām Shāhī kings of Ahmadnagar to defend their territory against the encroachments of neighbouring States and assign their conquest to Allāh Vardī Khān Turkmān in the reign of Emperor Shāh Jahān. One of them gives the 12th of Shawwāl, A.H. 1045 (20th March, A.D. 1636) as the date of the fall of Chandor fort and thus corrects the date of the event (16th of the same month of the same year) as recorded in the court-chronicles of Shāh Jahān.[3] These are important records containing elaborate historical data which are generally corroborated by the court-chronicles of Shāh Jahān.

Along the frieze of the outer porch of the Dīwān-i-Khāṣ in the Agra Fort is a long inscription in elegant Persian verse inlaid in *Nasta'līq* characters. It is of considerable interest not only on account of its elegant composition by Mīrzā Ṭālib Kalīm, the poet-laureate of Shāh Jahān, and its exquisite penmanship, but also because it brings to light an important fact otherwise not known to history. The *Tuzuk-i-Jahāngīrī*[4] (or the Memoirs written by Jahāngīr) mentions the installation of a gold chain, called the زنجیر عدل

[1] *Akbarnāma*, III, pp. 825, 836.

[2] *Cambridge History of India*, III, p. 709.

[3] Mullā 'Abdu'l-Ḥamīd Lāhorī, *Bādshāhnāma* (Bibliotheca Indica, Calcutta, 1867), I, p. 146.

[4] *Tuzuk-i-Jahāngīrī*, Persian text (Aligarh), pp. 3-4.

(Chain of Justice), by that emperor in his palace in such a way that the other end of it was kept hanging outside the Agra Fort on the riverside to enable the oppressed to pull it unobstructed. The emperor would thus call the aggrieved immediately to his presence and redress their grievances. It was commonly believed that the above practice probably did not survive Jahāngīr. But the fifth and sixth couplets of the inscription under notice clearly suggest that the Chain of Justice continued to exist also in the reign of Shāh Jahān, as they say, 'The path of tyranny is absolutely closed (and) by his Chain of Justice oppression is stopped. I am proud of the Chain inasmuch as, by the King's equity, it is ever ready to do justice to those who seek it.'

Two Persian inscriptions of the reign of Emperor Aurangzīb discovered from the Golconda fort in the Hyderabad State deserve notice inasmuch as they not only refer at some length to the first siege of Golconda by Prince Muḥammad, son of Aurangzīb, in A.D. 1656 but also hint at the chief reason, not otherwise known to history, of the Mughals raising the siege and concluding a treaty with 'Abdu'llāh Quṭb Shāh of Golconda. 'Among the nobles of the king (Aurangzeb),' says one of the epigraphs, 'there was one, Mīr-i-Mīrān, who had promised to conquer the fort and make it over to the king within three days .... By the Divine decree a gun-shot struck the body of Mīr-i-Mīrān in such a manner that he expired in that very entrenchment (from where he was bombarding the fort). Three days after his death a treaty was concluded......' This shows that the Mughuls had to come to terms with 'Abdu'llāh Quṭb Shāh because they could not afford to prolong the siege on account of the death of their able general.

A Persian epigraph fixed to the *miḥrāb* of Shāh Changī Madārī's mosque at Dīdwāna in the Jodhpur State mentions the completion of the mosque on the 7th of Zil-ḥajja, 5th regnal year of Sulṭān Muḥammad Mua'ẓẓam Shāh Bahādur 'Ālamgīr. The inscription is of much historical value inasmuch as history is silent about Sulṭān Muḥammad Mua'ẓẓam Shāh Bahādur ever assuming his father's title 'Ālamgīr ('the Conqueror of the World'). Only two coins in the coin cabinet of the Central Museum at Lahore [1] style him as 'Ālamgīr II, but the authenticity of this view was doubted. This epigraph, however, supports the numismatic evidence and makes an interesting contribution to our knowledge.

The Ailuru (Krishnā District) inscription of Mīr Jumla is an interesting record written in Sanskrit, which testifies to the tolerance and respect shown by the Muslim rulers for the religious practices of the Hindus. It states that Mīr Jumla Muḥammad Syed Nawāb who was an officer under 'Abdu'llāh Quṭb Shāh (of Golconda) of the seventeenth century A.D. had a *sarvatōmukha-yajña* performed by Vēmuri Anantanārāyaṇa Sōmayājin and granted him an *agrahāra* for the teaching of the *Vēdas* and *śāstras* and for extending hospitality to strangers. The merit of the gift is assigned to the Sulṭān.

In the Khānqāh of Ḥaẓrat Tārikīn at Nagaur is a large stone slab bearing a Persian quatrain inscribed in ornamental *Thultho-Naskh* characters in relief. Although not of historical value, it is of some palaeographic interest and is a good specimen of pre-Mughul ornamental calligraphy. The letters which must, as a rule, stand alone have been so joined to the succeeding ones merely for ornamental purposes that they baffle the reader at the outset. The quatrain pathetically requests the visitor to offer a prayer for the supplication of the dead.

[1] *Catalogue of Coins in the Punjab Museum* (Oxford, 1914), II, pt. II, pp. 273, 276.

ŚIŚUPĀLGARH 1948:

AN EARLY HISTORICAL FORT IN EASTERN INDIA

By B. B. Lal

The Excavations Branch of the Department recently carried out excavations at an early historical site called Śiśupālgarh, near Bhuvaneśvar in Orissa, already famous for its medieval temples, and brought to light a square fort with an excellent lay-out and an elaborate system of gateways. In the following pages is presented an interim report on these excavations, summarizing the results and indicating their importance in the history of India in general and of Orissa in particular. A full report with detailed drawings and several other photographs will be published later.

CONTENTS

1. INTRODUCTORY

At present one of the outstanding problems of Indian archaeology is to bridge the long gap that separates the Indus Valley civilization of the third-second millennia B.C. from the cultures of the early historical period (*c.* fourth century B.C.). If we could find sites which may have the remains of the Harappā culture at the bottom and of the early historical

period at the top with continuous occupation between the two, the problem would be easy of solution. But that being not the case, the problem has to be tackled by digging several sites and grouping them into two series, namely, (i) sites with the remains of the Harappā culture at the bottom and those of later cultures overlying them, and (ii) sites with the remains of the early historical period at the top and of earlier cultures underlying them. Thus, with two fixed points, one at the bottom and the other at the top of the chronological scale, and working from the known to the unknown, in the former series upwards and in the latter series downwards, it would be possible to build up a sequence of the various ancient cultures which would ultimately fill up this gap.

Such a culture-sequence, however, may have to be based mainly on the evidence of pottery (and in some cases of other industries as well), since, as experience tells us, coin-evidence becomes rarer the farther we recede into the period before Christ. A beginning in the direction of ceramic stratigraphy of the early historical sites was made during the 1945 excavations at Arikamedu near Pondicherry in French India.[1] Here the local ceramic industries were duly classified in chronological order on the basis of their stratigraphical relationship with a characteristic Mediterranean ware called the Arretine whose import into India falls between A.D. 20–50. Amongst the local wares thus dated were dishes of a distinctive type bearing on the inside of the base concentric rings of rouletted pattern, a design characteristic of the Arretine ware and evidently borrowed from it. This 'rouletted ware' was again discovered in 1947 at Brahmagiri (Mysore State), where it provided a datum-line for the local Āndhra, Megalith and Stone Axe cultures.[2] Thus, a reasonable advance was made in the building-up of a time-table of South Indian cultures of a few centuries before and after Christ.

But how to proceed to the northern plains, where evidence for bridging up the gap is likely to be obtained, was the problem. Amarāvatī, in the Guntur District of Madras, was already known to have yielded the rouletted ware.[3] Here, about 1½ miles to the west of the site of the famous Buddhist stūpa are the remains of an ancient township, which in all probability represents Dhanakaṭaka of the inscriptions. An excavation of this habitation-area was evidently the next step, since, with the rouletted ware as the fixed point of chronology, the culture-sequence of the site would have been easily worked out and the chain thus carried as far north as the bank of the Kṛishṇā river. But with a view to hurriedly carrying the evidence further north, excavations were undertaken during April–June, 1948, at the site called Śiśupālgarh, near Bhuvaneśvar in the Orissa Province. Happily, this proved more than a success, since not only were the rouletted ware and other dating factors duly discovered but an excellently laid-out fort of the pre-Christian era was also brought to light.

The work was carried out by the Excavations Branch of the Department under my direction, with assistance from Dr. Y. D. Sharma and Messrs. B. K. Thapar, N. R. Banerjee, R. C. Kar and K. V. Soundara Rajan. Over forty research-students and attachés from various Indian Universities and institutions, as also from China and Ceylon, joined the excavations. The Orissa Government provided facilities for the work and deputed Mr. K. C. Panigrahi and a few other University lecturers to participate in the excavations. The pottery has been classified by Mr. S. C. Chandra ; Mr. K. Deva has written the section on coins ; Dr. A. S. Altekar has contributed a note on the gold coin ; and Mr. B. K. Thapar has written the section on miscellaneous finds. Grateful acknowledgment is also due to Mr. B.

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[1] *Ancient India*, no. 2 (July, 1946), pp. 17ff.

[2] Ibid., no. 4 (July 1947-January 1948), pp. 180ff.

[3] Ibid., no. 2, p. 49.

Saran, surveyor; Messrs. R. Singh and L. Dutt, draftsmen; and Mr. S. G. Tewari, photographer.

In the following pages is presented a preliminary report on these excavations, summarizing the results and indicating their significance in the history of India in general and of Orissa in particular.

2. THE SITE AND ITS ENVIRONMENTS

(Fig. 1 and pls. XXVII–XXIX)

The ruins of Śiśupālgarh (literally, Śiśupāl Fort), 20° 13′ 30″ north lat. and 85° 51′ 30″ east long., are located about 1½ miles to the east-south-east of the town of Bhuvaneśvar, District Puri, Orissa. While going from the Liṅgarāja temple towards the Dayā river along the Puri road one sees about a hundred yards to the left the impressive fortification-wall rising some 25–30 feet above the surrounding plains. The fort forms a rough square on plan. Oriented approximately along the cardinal directions, each of its sides measures about three quarters of a mile long, thus enclosing an area a little over half-a-square mile. The contours clearly suggest the existence of corner-towers (pl. XXIX A) and eight large gateways, two on each side, besides about the same number of smaller openings (pl. XXIX B) distributed all over the perimeter. The gateways are so placed that if the distance between two corner-towers of any side is trisected, a gateway will be found at or near each point of trisection. Such a disposition clearly suggests a regular planning not only of the fortifications but presumably also of the streets inside, which are likely to have run east-west and north-south, connecting the opposite gateways in a grid-pattern.

Owing to soil-deposits accumulating during centuries of constant occupation the ground-level inside the fort is about 15 feet higher than that on the outside. But it may be pointed out that traces of ancient habitation in the form of pottery and other objects are obtainable in a fairly wide area even outside the fort. On the north, potsherds can be picked up as far as the Brahmeśvar temple, while on the west they continue up to the Bhuāsni temple (see fig. 1). On the south as well as on the east ancient habitation does not seem to have extended far beyond the defences. Thus, the fort, while being too large for a mere citadel enclosing only the royal palaces and attached residences, did not accommodate the entire population, a considerable section of which dwelt outside its confines.

The fort is circumscribed by the waters of a streamlet called the Ganguā or Gandhavatī. The main current, which flows past the western side of the fort (fig. 1 and pl. XXVIII), has its source in the hilly tracts to the west of Mancheśvar, some 6 miles north of Śiśupālgarh, and joins the Dayā river 7 miles further south. Whether this main line of the stream is natural or diverted, it seems fairly reasonable to imagine that the builders of the fort, taking advantage of the proximity of this stream, trained its waters around the northern, eastern and southern sides of the fort, thus producing a moat with a perennial supply of water.

To the south-south-east of the fort, at a distance of about 3 miles as the crow flies, lie the Dhauli Hills, where on a low granite boulder are inscribed the edicts of Emperor Aśoka.[1] After his conquest of Kaliṅga, which entailed immense loss of human life, Aśoka decided not to indulge in any such warfare in the future. He turned a Buddhist and also took steps to propagate that religion amongst his people by such means as inscribing edicts on pillars and rocks at several places throughout the empire. At Dhauli, the edicts were addressed to the Mahāmātras of Tosali who were asked to read them out to the public on

[1] E. Hultzsch, *Corpus Inscriptionum Indicarum*, I (Oxford, 1925), pp. 84ff.

ŚIŚUPĀLGARH AND ITS ENVIRONMENT

Fig. 1

certain specified occasions. Seemingly therefore an ancient township hereabouts bore the name of Tosali.

Again, about 6 miles to the west-north-west of Śiśupālgarh are the Khaṇḍagiri-Udayagiri Hills which contain several large and small caves. One of them, called the Hāthīgumphā or Elephant's cave, contains the famous inscription of King Khāravela narrating the principal events of his life year by year. Another cave, called the Vaikuṇṭha-pura cave, bears an inscription which shows that it was excavated under the orders of the queen of Khāravela. This shows that these caves and also the habitation-area somewhere in the neighbourhood pulsated with life during the couple of centuries before Christ.

Amidst these environments of the pre-Christian era lies the Śiśupāl fort; but not much was known about its antiquity until it was revealed by the present excavations. Amongst the objects known to have been previously collected from the site were several beads (including some collared and a 'boat-shaped' one) and a terracotta *bulla*, based vaguely on Roman coinage and ascribable to the early centuries A.D.[1] Terracotta ear-ornaments and some pottery had also been collected from the site by several antiquaries but their chronological horizon was not recorded. The site, however, was known for its potentialities and the present excavations have confirmed them.

* * * * * * *

The present name of the fort has evidently been derived from the name of a small village, Śiśupāl, located in the eastern sector of the fort itself. The view that the fort was constructed by King Śiśupāla mentioned in the *Mahābhārata* or by Śiśupāla Kesari of the Kesari dynasty does not hold good, since, as the excavations revealed, the occupation of the site did neither go back as early as the *Mahābhārata* period nor continue as late as the Kesari dynasty.

The possibility of Śiśupālgarh being identical with either Tosali of the Aśokan edicts or Kaliṅganagara of Khāravela's inscription or both may, however, be considered. But it must be stated at once that no inscription or other authentic evidence has so far been obtained to settle the proposition either way. Thus, only circumstantial evidence may be used, which, however, cannot be conclusive by itself.

At Dhauli, opposite the granite boulder bearing the Aśokan edicts, there is an open stretch of land where one can find traces of ancient habitation in the form of early pottery and other antiquities. Similar remains are also obtainable along the southern periphery of the hill. A systematic excavation of these areas might reveal evidence regarding the identity of the Mauryan or pre-Mauryan town of Tosali. One therefore feels inclined to wait for the result of such an excavation rather than hurriedly locate Tosali elsewhere.

To turn to the possibility of Śiśupālgarh representing the site of Kaliṅganagara. The Hathigumphā inscription does not say anything about the distance and direction of the city of Kaliṅga from the Khaṇḍagiri-Udayagiri hills and therefore the city could be anywhere—far or near—irrespective of the location of the inscription. If the city was somewhere in the neighbourhood, the claim of Śiśupālgarh has to be taken into consideration. According to the inscription, Kaliṅganagara was provided with fortifications and King Khāravela repaired the gateway and fortification-wall which had been damaged by a storm. Now, no fortified town of comparable date except Śiśupālgarh is known to exist near about the Khaṇḍagiri-Udayagiri hills; secondly, the excavation did reveal a collapse and subsequent repair of the southern gateway-flank of the fortification (below, p. 77).

[1] The 'boat-shaped' bead and terracotta *bulla* referred to here are in the Asutosh Museum, University of Calcutta.



Photograph: Air Survey of India Ltd., Dum Dum

Air-view of Śiśupālgarh, 1948, showing: A, the Habitation Area (SP I); B, the Cutting across the Defences (SP II); C, the excavated Gateway (SP IV); and D, the site of the monolithic pillars. The zig-zag band around the fort is a streamlet, probably an ancient moat. Scale 1" = app. 310 yds.



Śiśupālgarh: general view showing a part of the western defences with the stream in the foreground, looking north-east



A. *Śiśupālgarh: north-west corner-tower with the stream in the foreground, looking north-east*



B. *Śiśupālgarh: one of the smaller openings in the western defences, with the Liṅgarāja temple in the background, looking west*

To face page 67



The Habitation Area (SP I), showing two blocks of houses with a well of earlier period in between

On these pieces of circumstantial evidence, a presumption is raised in favour of Śiśupālgarh being identical with ancient Kaliṅganagara. But, indeed, nothing can be conclusively said until some definite evidence is forthcoming from the site itself.

3. SCOPE OF THE WORK AND A SUMMARY OF THE RESULTS

The present excavations were designed to ascertain: (*a*) the culture-sequence and chronology of the site, (*b*) the nature and formation of the defences, and (*c*) the plan of one of the gateways. With these objectives, three separate areas were selected for operation. For (*a*), digging was done well in the interior of the fort in an area which was expected to reveal vertically the maximum length of occupation (SP I, marked A in pl. XXVII). For (*b*), a trench was laid across the fortification-wall at one of its highest points, between the two gateways on the western side (SP II, marked B in pl. XXVII). For (*c*), the gateway nearer the north-west corner-tower on the western side was taken up (SP IV, marked C in pl. XXVII), since, besides being in a fairly good state of preservation, it had the practical advantage of being close to the Cutting across the Defences (SP II) for any subsequent correlation.

The excavations revealed that the site was occupied from the beginning of the third century B.C. to the middle of the fourth century A.D. Throughout this occupation there was one integral culture, although, no doubt, there were gradual changes in some of the industries. For example, the bright-red polished ware, characteristic of the earlier levels, began degenerating in fabric and technique about the beginning of the second century A.D. and gradually changed over to ill-fired, ochre-washed ware at the end of the same century. And, as was only to be expected, by the beginning of the third century A.D. some old pottery-types fell into disuse and were replaced by new ones.

The defences were erected at the beginning of the second century B.C. In Phase I, they consisted of a clay-rampart, some 25 feet high and over 110 feet wide at the base; in Phase II, a 4–6 feet thick covering of laterite gravel was added on to the top of the clay-rampart; while in Phases III and IV the clay-filling was retained by baked brick revetments on either side. The defences remained in use till about the abandonment of the site, although towards the latter part they had structurally degenerated.

The Gateway, constructed of large well-dressed laterite blocks, had a passage about 25 feet wide between the flank-walls and was provided with two gates, one near the entrance and the other about 100 feet further back. Immediately behind the former gate was a guard-room(?), while adjacent to the latter gate was an ancillary passage meant presumably for controlled admission at late hours.

The site, as a whole, is a remarkable one and large-scale excavations, spread over a period of at least three to four field-seasons, are necessary to bring to light a reasonably good picture of it.

4. THE HABITATION AREA (SP I)

(Fig. 2 and pls. XXX, XXXI A and XLI A)

With a view to discovering the culture-sequence of the site, from its beginning to the end, excavations were undertaken in a 60-foot square area lying well in the interior of the fort (marked A in pl. XXVII). This was sub-divided into nine 20-foot squares, of which some were completely excavated and others only partially. Vertically, most of these cuttings were carried to a depth of 14½ feet below the surface, at which level the sub-soil water was encountered. Deep digging was done only in a limited area, 12 by 6 feet, in one of the squares

where the natural soil was reached at a further depth of 10 feet below the subsoil water. These 24½ feet of occupational deposits unfolded the story of a culture which was essentially the same throughout, but had, as might be expected, its own stages of adolescence, maturity, decline and subsequent decay.

(i) The Periods (fig. 2): their outstanding features

On the basis of the pottery, which is usually the most distinctive industry of a culture, the Śiśupālgarh culture can be sub-divided into the following Periods, from the bottom upwards:

I. The *Early Period* represents the formative stage of the Śiśupālgarh culture, which, through a process of evolution, matured in the following Period, IIA. The pottery in the Early Period was essentially plain, devoid of any decorations whatsoever. It was largely wheel-turned and varied in colour from dull-grey to terracotta-red. Since digging in these deep levels was restricted to a very small area other finds were not many. Similarly, no structural remains were encountered, but that should not necessarily mean that the buildings in this Period were made of some perishable material like timber. It is, however, important to note that there were no defences at Śiśupālgarh during this Period.

IIA. The *Early Middle Period* presents the Śiśupālgarh culture in its full bloom. Herein the pottery got sophisticated and certain evolved types made their appearance as the industry advanced. There was predominance of the bright-red polished ware which was well fired and nicely finished. Besides, incised and applied decorative patterns were also used. The black-and-red ware of the 'megalithic' fabric appeared for the first time at Śiśupālgarh at the beginning of this Period (in layer 20). Further up in the same Period (in layer 12A) was found the earliest specimen of the rouletted ware. From various levels of the Period were obtained terracotta ear-ornaments, iron implements of peace and war and beads of agate, carnelian, quartz, etc. Structures, constructed of large chiselled laterite blocks, were observed at four different levels, but, since digging in them was essentially vertical, no detailed plans were recovered. The presence of brickbats indicated the use of bricks for constructional purposes, but no brick structure as such was met with.

Associated with the late levels of this Period was a pottery ring-well, 1½ feet in diameter, surmounted by a stone-slab with a central aperture of the same diameter as the mouth (pl. XLI A). The well continued to be used in the following sub-Period, IIB, and was then buried under structures of Period III (pl. XXX).

The most significant event was the construction of the defences at the beginning of this Period. What particular circumstances led to this construction cannot be determined in the present state of our knowledge, but the moment must certainly have been a remarkable one in the history of the site.

IIB. The *Late Middle Period* shows the Śiśupālgarh culture in a stage of decline and transition. The bright-red polished slip, so characteristic of the pottery of the preceding Period, became increasingly weaker, while in some cases ochre-wash was used instead of the slip. The decorative patterns, too, deteriorated in respect of variety and execution. Mention, however, may be made of the occurrence in a late level of this Period (layer 7) of three specimens of 'northern black polished ware'.[1] This ware is found in abundance in the Gangetic plains, and its presence as far south as Śiśupālgarh, though in a very restricted degree, is significant.

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[1] *Ancient India*, no. 1 (January, 1946), pp. 55ff.

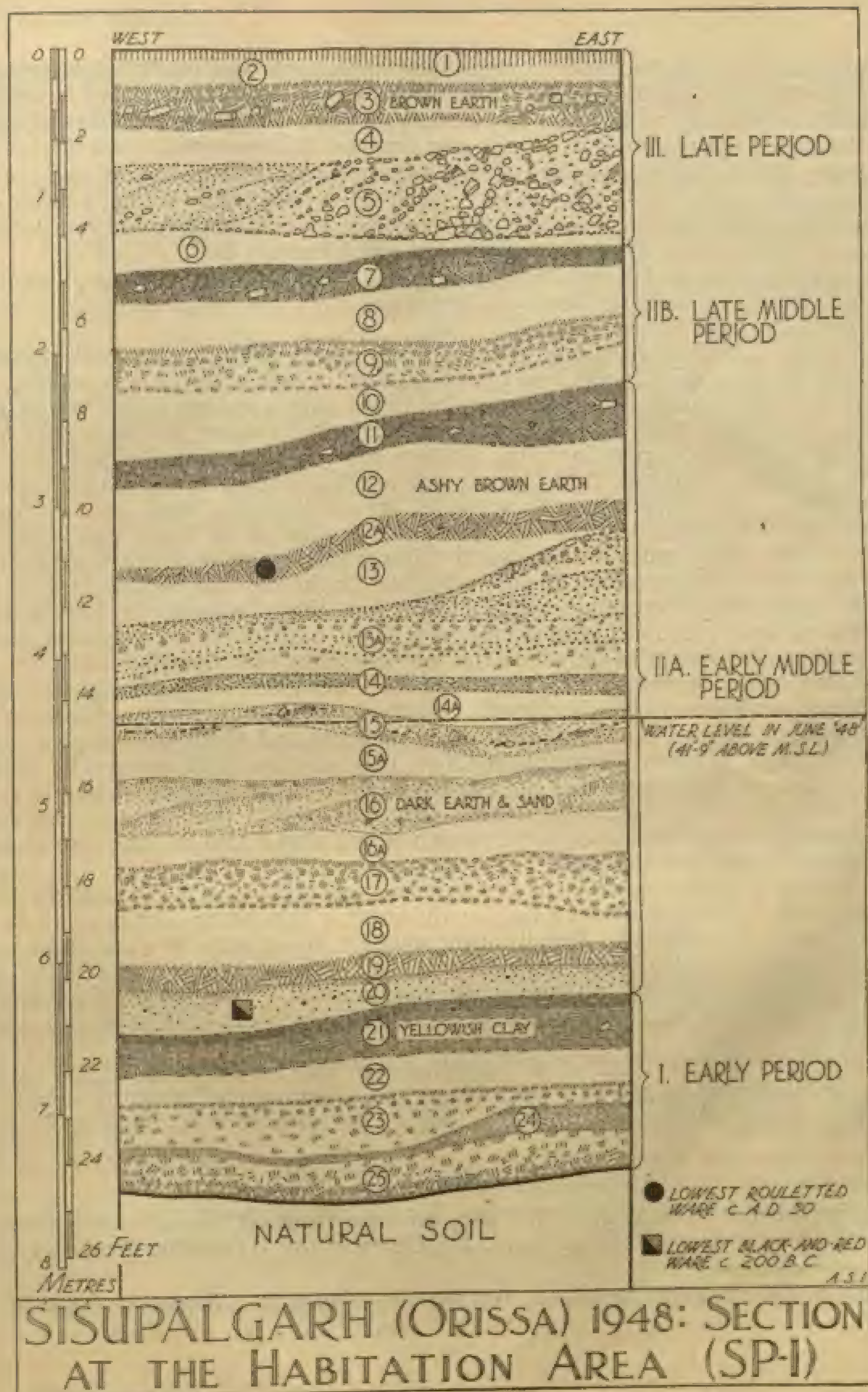

WEST
EAST
BROWN EARTH
III. LATE PERIOD
IIB. LATE MIDDLE PERIOD
ASHY BROWN EARTH
IIA. EARLY MIDDLE PERIOD
WATER LEVEL IN JUNE '48' (41'-9" ABOVE M.S.L.)
DARK EARTH & SAND
YELLOWISH CLAY
I. EARLY PERIOD
NATURAL SOIL
LOWEST ROULETTED WARE c. A.D. 50
LOWEST BLACK-AND-RED WARE c. 200 B.C.
A.S.I.
26 FEET
METRES
SISUPÂLGARH (ORISSA) 1948: SECTION AT THE HABITATION AREA (SP-I)

FIG. 2

In addition to terracotta ear-ornaments, iron implements and beads, which were also obtained in the preceding Period, two new classes of objects, namely, glass bangles and terracotta *bullae* were met with. The earliest date for glass bangles in India has not yet been finally determined. No example has so far been reported to have come from a level prior to the beginning of the Christian era, nor do the earliest Śiśupālgarh examples carry us any farther, since they come from a level which is ascribable to the first or second quarter of the second century A.D. It may, however, be noted that glass beads have been recorded at Bhir Mound (Taxila, West Punjab) as early as the fifth century B.C.

The terracotta *bullae* fall into two classes: one, with animal figures, and the other, with human heads. The latter variety is important since the heads seem to have been imitated from those on Roman coins.

III. In the *Late Period* the bright-red polished ware of the preceding levels practically changed over (but for a few exceptions) to one with red or yellowish-red ochre-wash. This change in the outer appearance of the ware coincided with a change in the layout of the structures. Normally, these would indicate a change of culture but there was a very significant piece of evidence pointing to the contrary: an overwhelming majority of the pottery-types and decorative patterns, both incised and applied, remained unchanged. Besides, no other industry, e.g. terracotta ear-ornaments, iron implements, beads, etc., showed any abrupt change. It indicated, therefore, merely a *transition* in the fabric and general appearance of the pottery and not a change of culture; and the signs of this transition were already manifest in the preceding Period, when the bright slip had become insipient and the texture had started becoming coarser. Nor does the change in the lay-out of the structures necessarily mean a change of culture. At the most, it would suggest a break in the occupation which might be only local and not extending over the whole site.

As stated earlier (above, p. 67), digging in the lower levels was generally restricted to small vertical pits. But in the late levels a fairly intelligible plan was obtained. Two adjoining houses, built of laterite blocks and lying north and south, were exposed with a 2-foot wide space between them (pl. XXX). This narrow space cannot be taken to represent a lane; it only shows that the owners of the two houses did not like to have a common partition wall. It may be recalled here that such a practice was recorded by Kauṭilya in his *Arthaśāstra*[1], and similar instances are also found in the ruins at Sirkap (Taxila, West Punjab) and elsewhere.

The northern house consisted of two rooms, measuring 10×8 feet and 10×9 feet respectively, with a verandah, 19×8 feet, in the front. This house continued to be used till the late levels of the Period. Details of the southern house were not clear, but it had an over-all dimension of 33×25 feet. In course of time, repairs and even replanning of the house took place and two such re-adjustments were noticed. Towards the fag-end of the Period were built some baked-brick houses, in one of which can still be seen a door-sill (pl. XXXI A).

Mention may also be made of the occurrence in this Period of an etched carnelian bead (to be illustrated in the full report) and two fragmentary terracotta coin-moulds (pl. XLIX A and p. 99), the latter throwing light on the method of casting coins in ancient India.

(ii) CHRONOLOGY (figs. 2 and 3)

To compute the chronology of the site, evidence from all the cuttings, namely, the Habitation Area (SP I), the Cutting across the Defences (SP II) and the Western Gateway

[1] R. Shamasastry, *Kauṭilya's Arthaśāstra*, Text (Mysore, 1924), p. 166; Translation (Bangalore, 1929), p. 189.

(SP IV), has been pieced together. Several dated or datable objects were recovered, and since they occurred at different levels, from the bottom upwards, every one of them served as a cross-check for the other. The following type-finds provide the main evidence:—

(i) the rouletted ware,
(ii) the black-and-red ware,
(iii) a coin of Huvishka (p. 98, no. 9),
(iv) a gold coin imitating the Kushan type (p. 97, no. 1 and pl. XLVIII A), and
(v) 'Puri-Kushan' coins (p. 98, nos. 10–13 and pl. XLVIII B, 5).

The earliest examples of the rouletted ware from Śiśupālgarh are comparable in form, texture, colour of the slip and general appearance to the earliest examples of the same ware found at Arikamedu during the 1945 excavations.[1] The Arikamedu examples, on the basis of their association with the imported Arretine ware, are ascribable to the first or second quarter of the first century A.D. But the rouletted ware was not as prolific at Śiśupālgarh (where in all twenty sherds were obtained) as at Arikamedu. Very likely, it was an imported item brought along by inland or coastal trade from Arikamedu or Amarāvatī or some other place in south-east India. (The coarser examples of the ware found in the late levels might have been produced locally.) However, in view of the close resemblance of the earliest Śiśupālgarh examples with the earliest Arikamedu ones, the two cannot be far removed from each other in point of time; and it is reasonable to assign the earliest specimens from Śiśupālgarh to *c.* A.D. 50, with a margin of a decade or so on either side. Thus, the lowest level which yielded this ware, namely layer 12A, can be said to have accumulated between A.D. 40 and 60 (fig. 2).

Another important piece of evidence is provided by the occurrence on this site of the black-and-red ware of 'megalithic' fabric. So far no megaliths have been discovered in the neighbourhood of Śiśupālgarh, and at present the only probable explanation seems to be that the 'megalithic' pottery was brought over to Śiśupālgarh by some occasional visitors very probably from the South, where megaliths occur widely and in abundance.

The Indian megaliths have been and still are, to a considerable extent, a baffling problem in so far as their zone of origin, subsequent diffusion and, above all, dating are concerned. The 1947 excavations at Brahmagiri and Chandravalli revealed that the Megalithic culture had reached northern Mysore towards the last quarter of the third century B.C. There are other megalithic sites further up in Hyderabad and northern Madras, but since they are not so precisely dated as the two mentioned above, they may not be used in the present context. Furthermore, some megalithic pottery-types from Śiśupālgarh (though these are not the typical ones) are comparable to similar types in the same ware from Brahmagiri and Chandravalli. Thus, even in the absence of a very definite link (traceable through various sites when proceeding northwards) between the Mysore sites and Śiśupālgarh, it is reasonable to assume that the 'megalithic' ware began reaching the latter site at the end of the third or early in the second century B.C.

This date for the earliest black-and-red ware at Śiśupālgarh can be cross-checked, though only indirectly, by another evidence. Between the lowest rouletted ware, dated to *c.* A.D. 50, and the lowest black-and-red ware, intervened 10 feet of occupational deposits. To lay down an equation between the depth of deposits and the time taken for their accumulation is rather hazardous, but, on general grounds, these 10 feet of regular occupational strata cannot be expected to have accumulated in a period of less than two to three centuries (unless they represent a mere dump, which in the present case they did not). It could,

[1] *Ancient India*, no. 2 (July, 1946), pp. 45ff.

however, have taken longer for their accumulation, but the lower limit for the black-and-red ware at Śiśupālgarh is already conditioned, as shown above. Thus, a date about 200 B.C. seems to be a reasonable estimate for the first appearance of this ware on the site.

Between the lowest layer yielding the black-and-red ware, namely, layer 20, and the natural soil were another 4 feet of deposits, bearing the remains of the Early Period of the Śiśupālgarh culture (fig. 2). To determine the span of this Period in years would, again, be a matter of conjecture. However, in the general context of the site, a century or so would seem a reasonable duration.

Thus, the initial date of the site goes back to about 300 B.C. with a margin, if any, on the earlier side.

Now to the upper limits of the site. In the Habitation Area, as seen above, the earliest layer yielding the rouletted ware can be dated to *c.* A.D. 40–60. Between this and the present surface were 10-11 feet of deposits, representing, from the bottom upwards, the upper levels of Period IIA and Periods IIB and III respectively. Nothing precisely datable was obtained from these strata in this cutting. But in the corresponding strata of the Cutting across the Defences at SP II (fig. 3) were found two securely datable coins. One of them, a copper coin of Huvishka in a worn out condition (p. 98, no. 9) lay in layer 3B, about 5½ feet below the surface. This coin can be dated to the last quarter of the second century A.D. The other, a gold coin bearing a standing Kushan figure on the obverse and a 'Roman' bust on the reverse (p. 97, no. 1) was recovered from the foundations of a wall, the floor-level of which (top of layer 3) is about 3 feet below the surface. This coin is ascribable to the second-third quarters of the third century A.D.

The uppermost limit of the site is determined by the presence of the so-called 'Puri-Kushan' coins (of copper) in the latest levels of the site. At the Western Gateway (SP IV), a lump of four coins of this class was obtained from the débris overlying the ancillary passage. Another coin of the class lay in the deposits which had accumulated after the latest road-level in the main passage had gone into disuse. To these coins, a date of about the middle of the fourth century A.D. can be assigned, and that date, derivatively, represents the upper limit for the site.[1]

In summary, Śiśupālgarh was occupied between *c.* 300 B.C. and A.D. 350. The various Periods may be dated as follows:—

I (Early Period): *c.* 300–200 B.C.
IIA (Early Middle Period): *c.* 200 B.C.–A.D. 100.
IIB (Late Middle Period): *c.* A.D.100–200.
III (Late Period): *c.* A.D. 200–350.

5. THE CUTTING ACROSS THE DEFENCES (SP II)

(Fig. 3 and pls. XXVII, XXXI B–XXXIV A and XXXV)

In order to ascertain the character of the defences, a trench, 240 feet long and 20 feet wide, was cut across the fortification-wall at one of the highest points between the two gateways on the western side (pl. XXVII, marked as B; and pl. XXX A, marked as A). For over 80 feet the trench was carried into the interior of the fort in order to trace the various strata of occupation and to correlate them with the Phases of the defences. The natural soil was reached at a depth of about 50 feet from the highest point of the cutting and this necessitated digging through nearly 14 feet of subsoil water (pl. XXXIV A).

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[1] There are, however, some literary references indicating that the site was under occupation even during the medieval times. But, as seen above, the excavations have not yielded any corroborative evidence.



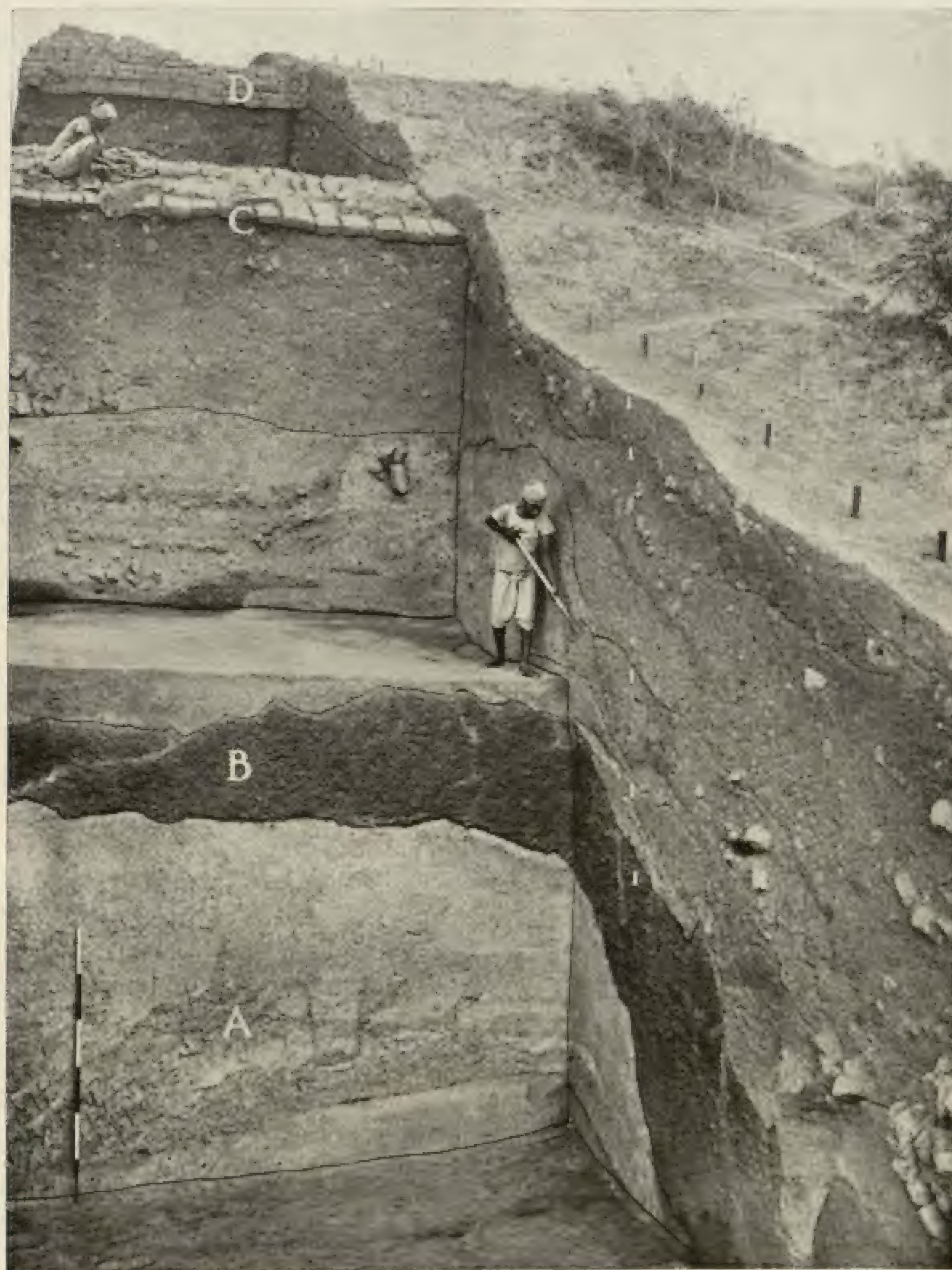
A. *Door-sill in the Habitation Area (SP I)*



B. *Cutting SP II: close view of the holes at the top of clay rampart*



The Cutting across the Defences (SP II), showing: AA, clay rampart, Phase I; BB, laterite gravel, Phase II; and CC, inner brick revetment and mud-packing, Phase III



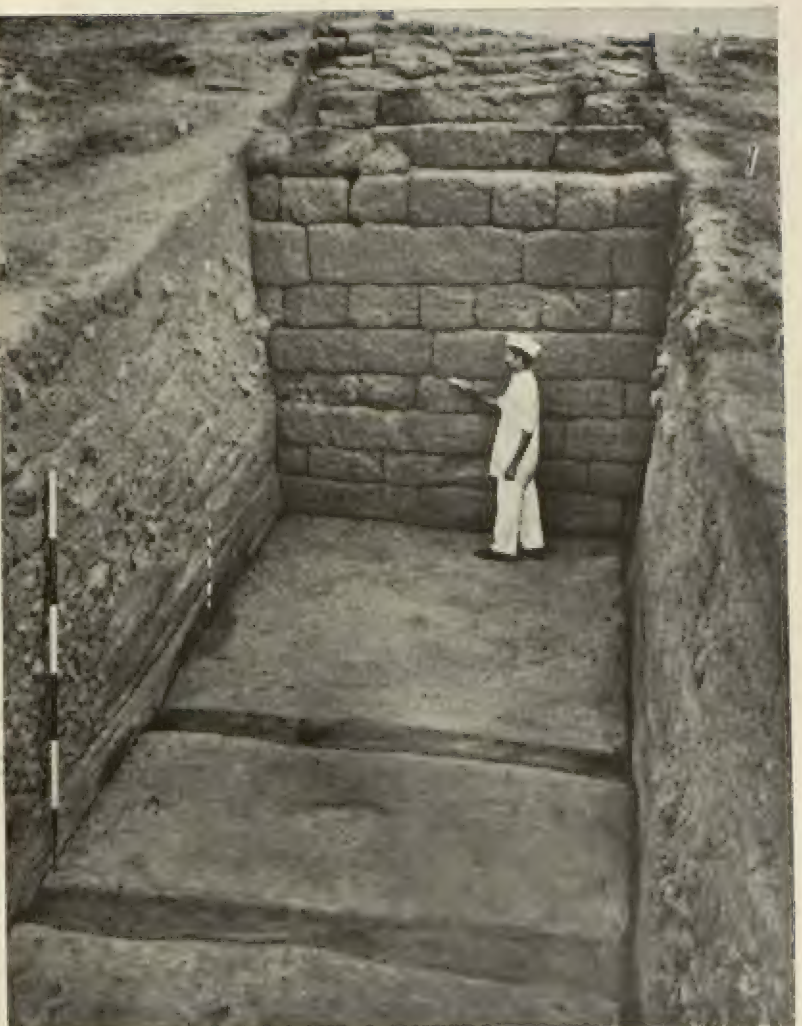
The Cutting across the Defences (SP II), view from outside, showing: A, clay rampart, Phase I; B, laterite gravel, Phase II; C, fallen (outer) brick revetment, Phase III; and D, revetment, Phase IV

PLATE XXXIV

To face page 73



A. *Cutting SP II (during excavation): digging below the subsoil water-level with the help of pumping machine*



B. *The Western Gateway (SP IV): cart-track in the passage-way*

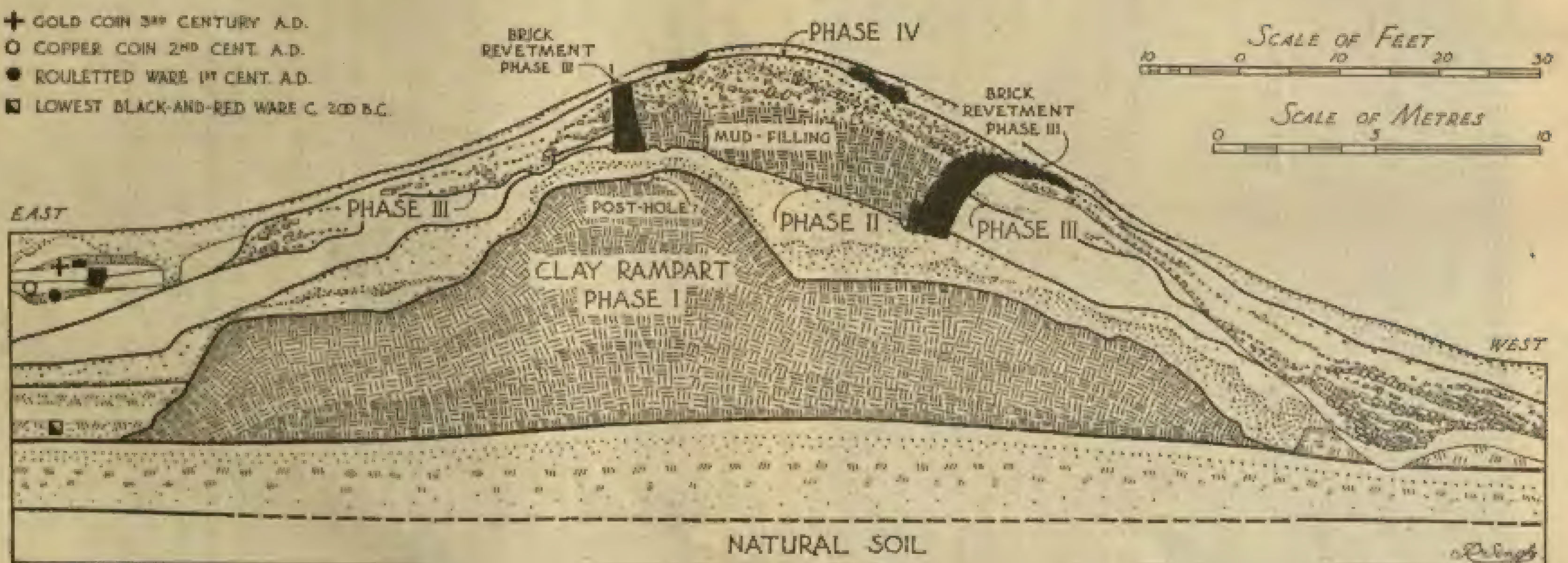

ŚIŚUPĀLGARH (ORISSA) 1948: SECTION ACROSS THE DEFENCES AT SP II
GOLD COIN 3RD CENTURY A.D.
COPPER COIN 2ND CENT. A.D.
ROULETTED WARE 1ST CENT. A.D.
LOWEST BLACK-AND-RED WARE C. 200 B.C.
SCALE OF FEET
10
0
10
20
30
SCALE OF METRES
0
5
10
BRICK REVETMENT PHASE III
PHASE IV
BRICK REVETMENT PHASE III
MUD-FILLING
PHASE III
POST-HOLE?
PHASE II
PHASE III
EAST
WEST
CLAY RAMPART
PHASE I
NATURAL SOIL

FIG. 3

Pre-defence deposits

The excavations revealed that the defences did not come into being with the first occupation of the site. Between the natural soil and the first Phase of the defences intervened 5-6 feet of occupational deposits, which, on the basis of the pottery contained in them, represented the Early Period of Śiśupālgarh culture. There was no black-and-red ware in these pre-defence levels.

The Phases of the defences

If the picture presented by this cutting may be taken to be a representative one, the defences fell into four main Phases, although, no doubt, there must have been occasional local repairs at several points on the perimeter.

Phase I. In the earliest Phase, the defences consisted of a massive clay-rampart over 25 feet high at this point (as it survived now) and 110 feet wide at the base (marked A in pls. XXXII and XXXIII). The sticky clay and earth used for its construction seem to have been dug out of the area which now lies close outside the rampart. Such a process must indeed have been very economical, since, while on the one hand it saved labour and money which would have been required for the transport of the clay from a distant place, it simultaneously produced, on the other, a ditch around the defensive wall.[1] Mention of such forts with moats around them has also been made by Kauṭilya in his *Arthaśāstra*.[2]

Owing to constant weathering, the original contours of the rampart-wall had anciently been lost, but, from what is left of it in the present cutting, it seems that above the flattish ramp, and in one build with it, rose a rather steep wall whose angle of inclination (37°–40° to the vertical) is indicated by the outer face (fig. 3). But to have confirmation on this point, it would perhaps be worthwhile to have another similar cutting elsewhere on the periphery of the defences.

On the top of the rampart-wall occurred a series of roughly circular holes, each about a foot deep and 10 inches wide, arranged at regular intervals of 1 foot 10 inches (pls. XXXI B and XXXII). They were found packed with laterite gravel and covered with a thin layer of clay. Their exact purpose is indeed difficult to determine without further evidence.

As to the date of the clay-rampart, there is a significant piece of evidence. Whereas the black-and-red ware was entirely absent from the pre-defence deposits, it occurred in the first occupation layer contemporary with the rampart. It also occurred in the deposits constituting the upper part of the rampart, but was again not to be found in its main body. Now, while the main mass of the rampart was built essentially out of the material excavated from the neighbouring pre-defence layers, the stuff lying on its top and in the first layer contemporary with it accumulated presumably during the process of construction; and remains in this building-débris were evidently associated with the builders themselves. Thus, the construction of the rampart was more or less synchronous with the arrival of the black-and-red ware at the site, that is, about 200 B.C. (above p. 71). Derivatively, therefore, the defences at Śiśupālgarh came into being somewhere in the first quarter of the second century B.C.

[1] It was intended to ascertain fully this point by carrying the trench well outside the defensive wall. But owing to the proximity of the nullah, deep-digging through the subsoil water could not be carried out with the limited resources at disposal. A strong pumping machine and more adequate funds would have helped to correlate the ditch with the defences.

[2] R. Shamasastry, *Kauṭilya's Arthaśāstra*, Text (Mysore, 1924), p. 51 ; Translation (Bangalore, 1929), p. 50.



Photograph: Dr. Y. D. Sharma

A. *Air-view of a part of the western defences, showing: A, the Cutting across the Defences (SP II); and B, the trenches at the Gateway (SP IV)*



B. *Cutting SP II: fallen (outer) brick-revetment of Phase III*



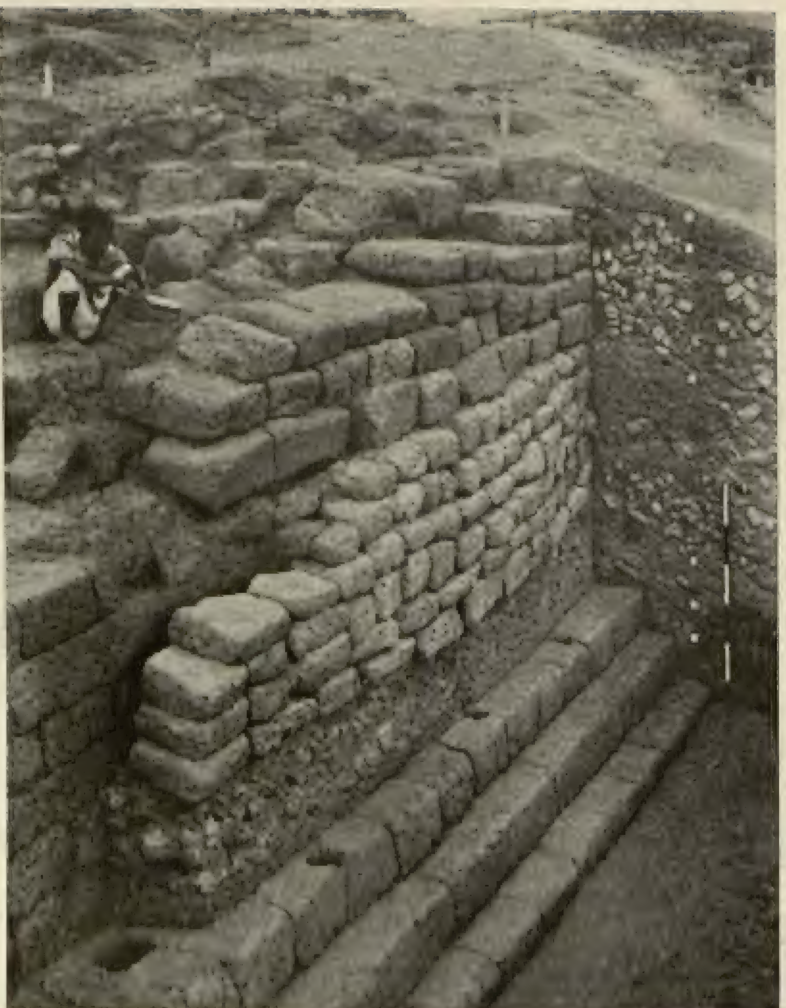
Western Gateway (SP IV) : steps leading to the top of the southern gateway-flank



Western Gateway (SP IV): part of the northern gateway-flank, looking south-east



Western Gateway (SP IV); south-east corner of the southern flank, showing laterite basement with superstructure of bricks



A. *Western Gateway (SP IV): later wall supporting part of the southern flank*



B. *Western Gateway (SP IV): repairs to the outer face of the southern flank*



A. *Entrance to the Western Gateway (SP IV): the survey-pole is placed in one of the door-sockets, while the left-hand figure stands in a probable guard-room*



B. *The monolithic pillars*

Phase II. During this Phase a 4–6 feet thick layer of laterite gravel was added on to the top of the clay-rampart marked B in pls. XXXII and XXXIII. Such a feature was also noticed at the Western Gateway and elsewhere in the sections of some of the monsoon-gullies round the periphery. The Phase does not seem to have been a long-lived one.

Phase III witnessed a change in the make-up of the defences. Two brick walls, 26 feet apart and respectively 2 feet 6 inches and 3 feet 6 inches thick (the thicker one being on the outer side), were built at the top of the laterite gravel and the space between them was filled up with mud and earth (marked C on pls. XXXII and XXXIII). Towards the interior of the fort and also on the outside can be seen the builders' ramp, 3-4 feet thick, which also helped to retain the brick walls. In the course of time, more material, including brickbats, was added to these ramps to hold the walls vertical. The Phase seems to have come to an end about the middle of the first century A.D. as is indicated by the presence of the earliest example of the rouletted ware in a layer which accumulated subsequently to this Phase.

Phase IV does not seem to have immediately followed Phase III, since a collapsed revetment of the latter Phase (pl. XXXV B) had been completely covered up, and possibly forgotten, before the revetments of this Phase came into being. These new revetments were built against the slope of the defensive mound and had a stepped exterior. Scrappy as they were, they just helped to keep up the show. The glory of the defences had gone, but their shadow lingered on.

The cutting yielded some valuable information regarding the date of the site in general. Above the rouletted ware (p. 71) were found, in succession, a copper coin of Huvishka dated to the second half of the second century A.D. (p. 98, no. 9) and a gold coin bearing a standing Kushan figure on the obverse and a Roman head on the reverse and ascribable to the second half of the third century A.D. (p. 97, no. 1). Overlying the latter coin were 4-5 feet of occupational deposits representing a period of a century or so. The regular occupation of the site ceased somewhere about the middle of the fourth century A.D., while the defences seem to have ceased functioning even earlier.

6. THE WESTERN GATEWAY (SP IV)

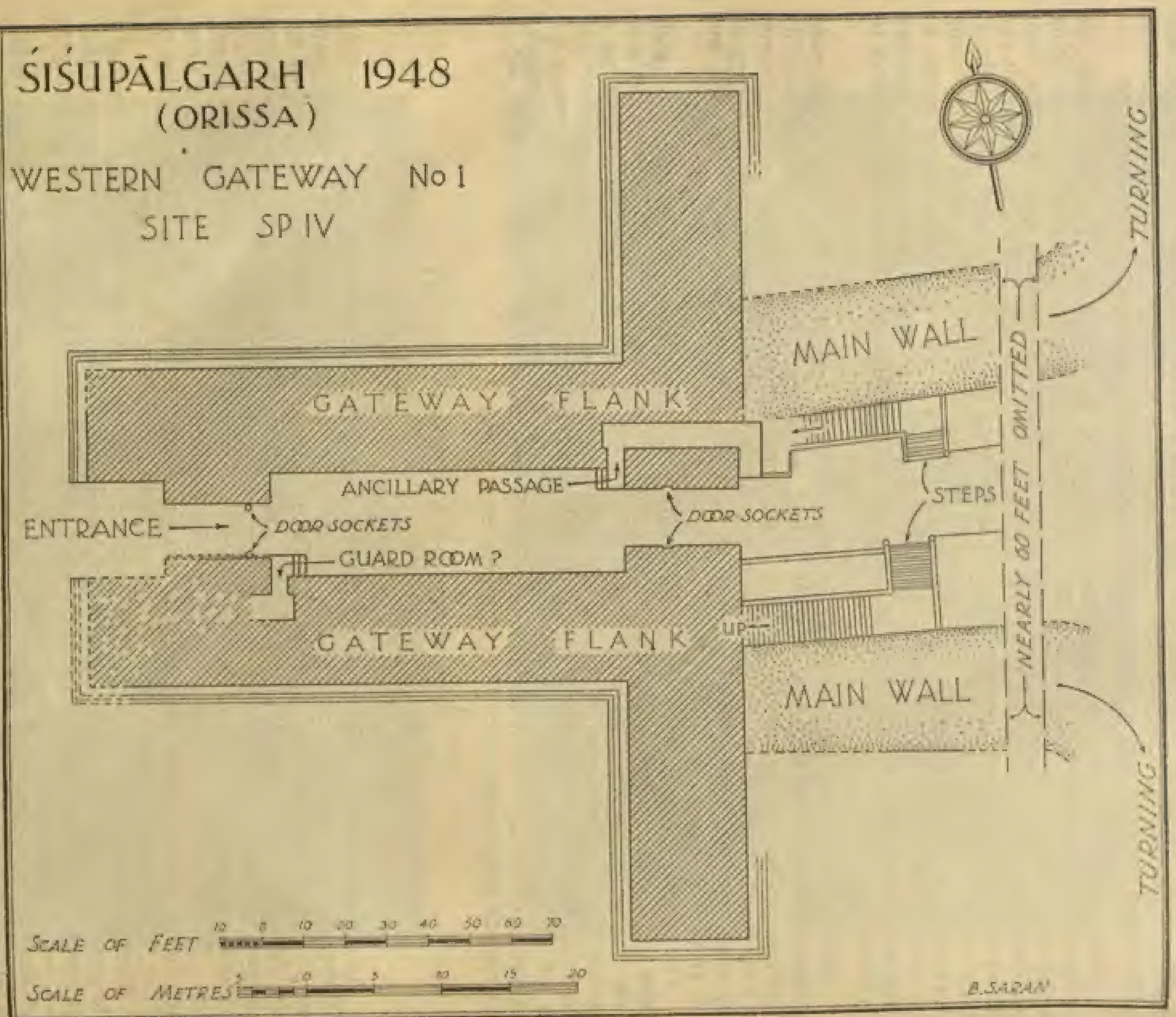
(Fig. 4 and pls. XXVII, XXXIV B, XXXV A, XXXVI–XL A and XLI B)

As stated elsewhere (above, p. 64), the fort had eight large gateways, two on each side. Of these, the one nearer the north-west corner on the western side was taken up for excavation (pl. XXVII, marked as C; and pl. XXXV A, marked as B). Here, the two ends of the main defensive wall turned outwards and each joined the heel of a massive L-shaped gateway-flank built of laterite blocks of an average size of $6 \times 2 \times 1$ feet.[1] The longer arm of the flank measured 160 feet and the shorter one 63 feet, while the width was roughly uniform, being 27-28 feet. The passage flanked by the two longer arms took the form of a slow-rising ramp, about 25 feet wide. Though it provided a straight access to the interior of the fort,[2] the entire system was well-organized from a defensive point of view.

There were two gates, one near the entrance and another further back at a distance of a little over 100 feet. Though no remains of door-leaves were obtained (for presumably they were made of wood), door-sockets were duly identified (pl. XL A), the width of each gate

[1] Though only one gateway was excavated, surface indications are that all the eight gateways had a roughly identical plan.

[2] This is unlike the curved passage discovered at the Harappā citadel during 1946, or the one to be seen on the eastern side of the defences at Kauśāmbī.



ŚIŚUPĀLGARH 1948
(ORISSA)
WESTERN GATEWAY No 1
SITE SP IV
GATEWAY FLANK
GATEWAY FLANK
MAIN WALL
MAIN WALL
STEPS
DOOR SOCKETS
DOOR SOCKETS
ANCILLARY PASSAGE
GUARD ROOM ?
ENTRANCE
UP
TURNING
TURNING
NEARLY 60 FEET OMITTED
SCALE OF FEET
10 0 10 20 30 40 50 60 70
SCALE OF METRES
5 0 5 10 15 20
B. SARAN

Fig. 4

being 13 feet. Immediately behind the first gate, and built into the southern flank, was a room (?), 9¾ feet long and 6 feet wide.[1]

Sections cut across the passageway revealed several successive streets which were made up either by ramming hard mud or laterite gravel or, as noticed in two or three cases, by paving with brickbats. No stone paving was, however, recorded. Cart-tracks were observed at various levels; in the example illustrated here (pl. XXXIV B) the gauge measured 4 feet 6 inches.

Adjacent to the inner gate, and pierced through the northern flank, was an ancillary passage, 5 feet 3 inches wide. It had a stone floor and was approached by three steps from the contemporary street-level. It appears that the entire passageway was open to the sky except at the two gates where the length of the portals was indicated by the rectangular blocks projecting from the longer arms of the L-shaped flanks.

The entire system at the gateway may be imagined to have functioned as follows. At a certain fixed hour in the night, the inner gate was closed, stopping all vehicular traffic beyond this point. Pedestrians could, however, get in or out through the ancillary passage. A little later, the outer or main gate was also closed, while the guards at its back probably still remained on duty.

To come back to the shorter arms of the L-shaped flanks. These had a solid basement, 14 feet high, made of laterite blocks. Immediately above the basement was a superstructure of baked bricks surviving to a height of twenty-seven courses, i.e. nearly 8 feet (pl. XXXVIII). Several plano-convex bricks were also found in the fallen débris of the superstructure (pl. XLI B). Access to the top of these structures was had by means of well-built flights of steps going up either way from the main passage (fig. 4 and pl. XXXVI).

Both the L-shaped flanks had offsets at the base along the outside only. At one point as many as four offsets were noticed, while three were exposed throughout. (It was not ascertained how many more offsets there were below the present water-level which was encountered at the fourth course.) The uppermost offset had a series of small holes, rectangular or roughly circular, arranged at intervals of 5-6 feet (pls. XXXIX A and B), of which the purpose is not clear.

During their lifetime, the structures at the gateway were repaired on several occasions. At one place on the outer side of the southern flank was observed a subsidiary wall built just to support the falling arm (pl. XXXIX A). The most notable fall, however, was that of the western face of the shorter arm on the south (pl. XXXIX B). The destruction over here seems to have been a sudden and violent one. The entire face had collapsed and, to hold the rest of the structure up, an emergency aid was rushed to the spot. Bricks and brickbats were piled up against it in all sorts of ways, and it was only at a later stage that regular stone facing was provided. That these parts of India are subject to occasional cyclones is well-known, and it is not unlikely that such an occurrence may have been responsible for this large-scale destruction[2].

The cuttings in this area also provided some important evidence for determining the upper limit of the site. In the débris, immediately overlying the latest road-level in the passage were found some 'Puri-Kushan' coins, ascribable to the middle of the fourth century A.D. This clearly shows that regular occupation of the site came to a close about that time.

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[1] The western end of the southern flank had largely been destroyed and no more than the foundation-slabs were available. Hence it was difficult to ascertain whether it was really a room or an ancillary passage similar to the one adjacent to the inner gate. However, this point can be verified if another gateway is excavated.

[2] Cf. above, p. 66.

7. THE MONOLITHIC PILLARS

Towards the centre of the fort (pl. XXVII, marked as D) can be seen a group of sixteen monolithic pillars of laterite, some of which are still standing intact, while of the others no more than the stumps remain (pl. XL B). No excavation was done here and it is not unlikely therefore that the stumps of many more may be found buried in the ground. Eight of the pillars, forming roughly an east-west row, mark the northern edge of the entire area, approximately 90 feet × 80 feet, covered by the group. On the north-east, the semblance of a chamber (9 feet × 8½ feet) is produced by the location of four pillars at the corner-points. The remaining pillars lie to the south on a slightly raised ground, but no plan can be made out without an excavation.

The average height of the pillars above the ground is 14-15 feet. Of this, a length of 4-5 feet at the bottom and also of 2-3 feet at the top is 2½-foot square in section while the remaining portion is faceted (with the exception of a couple of pillars which are circular in section), the faces numbering from eight to sixteen. On some of the pillars can be seen medallions of the type common at Bharhut and Sānchi and also in a few examples in the Khaṇḍagiri-Udayagiri caves. Across the top, these pillars have a horizontal socket, seemingly intended to hold superimposed beams or rafters.

As already stated, no digging was done in this area, but it looks as though a pillared hall stood here once.

8. THE POTTERY[1]

(i) Introduction

The pottery from Śiśupālgarh is essentially plain. Painted wares are entirely absent, and decorations, but for some simple incised and applied patterns, are not common. It is usually wheel-turned, save for a few exceptions.

Two ceramic industries, variations of an essentially integral culture, are noticed. Of these, the most prolific is a type of polished bright red ware, fine and well-fired. This ware occurs in and above the earliest occupation-levels of the site, till in the upper levels it is overlapped by a degenerate and crude ceramic industry, which typologically is the same as the preceding one, but is distinguished mainly by coarser ware, indifferent firing and red or yellow ochreous slip. The most distinctive type of vessel, and one which can be called typical of the Śiśupālgarh culture, is a 'knobbed' vessel, possibly a bowl-cum-lid, usually in grey or greyish black ware with or without concentric groovings on the inner base (pl. XLVI B; fig. 6, 1 and fig. 8, 12).

Black-and-red ware with bright polished surface is characteristic mainly of Period IIA, though a limited number of sherds of this fabric also occur in Period IIB. It may also be mentioned that these black-and-red-ware sherds bear resemblance in fabric, texture and shape to the megalithic ware of South India.[2]

A noteworthy ceramic evidence from Śiśupālgarh and one which helps in fixing the chronology of the site is the occurrence of the 'rouletted ware' in well-stratified deposits. As at Arikamedu (Pondicherry), where it was first discovered,[3] this ware occurs here in two varieties. Those from the lower levels have a brighter black polish, while the upper level ones are invariably grey with inferior finish. It seems that sherds of inferior fabric are local imitations, while those with brighter polish may have been importations.

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[1] Under my general guidance, this section has been prepared jointly by Messrs. S. C. Chandra and B. K. Thapar.

[2] *Ancient India*, no. 4 (1947-48), pp. 207ff.

[3] Ibid., no. 2 (1946), pp. 45ff.

Three sherds of the 'northern black polished' ware also deserve mention. In the Gangetic plain, this ware is usually associated with the Mauryan levels, while at Bhir Mound (Taxila I) it seems to have started as early as the fifth century B.C.[1] Here, however, these sherds have been found roughly in the same horizon as the rouletted ware, an occurrence which remains to be explained.

(ii) Characteristics of the pottery of Periods I–III

Period I

The pottery from Period I of the Śiśupālgarh culture is essentially plain and decoration is entirely absent. The predominant ware is generally dull grey or red in colour, polished in a few instances. Firing, except on a few indifferently-baked sherds, is good. Stray fragments of polished black ware also occur in the Period but become more prominent in the early levels of Period IIA. The occurrence of black or grey sherds with or without concentric grooves on the inner base round a central knob needs mention, as this type persists in all the occupation-levels of the site and is characteristic of Śiśupālgarh ceramics in general (pl. XLVI B; fig. 6, 1 and fig. 8, 12). Black-and-red ware which occurs in the make-up of the defences (Period IIA) is significant by its absence in this Period.

Period IIA

There is no basic difference between the ceramic industry of this Period and the preceding one. However, the introduction of certain evolved types as the industry progressed, the initiation of applied and incised decorative patterns and the comparative predominance of brightly polished red ware deserve mention. A subsidiary ceramic industry mostly confined to Periods IIA and B has a pinkish buff slip with a fine core showing certain evolved types. Special mention may be made of the occurrence of the black-and-red ware of the 'megalithic' fabric.

In the early levels of this Period were also found a few black sherds with a highly polished surface, though not comparable with the almost metallic lustre distinctive of the 'northern black polished' ware. In a late level (fig. 2, layer 12A) we have the noteworthy occurrence of the rouletted ware, providing an important dating evidence for the site.

Period IIB

The pottery from this sub-group differs from the preceding one by its coarser ware, indifferent firing and a distinct change in the slip from polished bright red to weak red. Moreover, the variety of types and the wealth of incised decorations now show a marked decline. The imported rouletted ware and three sherds of the 'northern black polished' ware are important finds of this sub-Period. How the former helps in dating this Period has already been discussed above (p. 71); the presence of the latter as far south as Śiśupālgarh is significant.

A unique find from this Period consists of a turtle-shaped spouted vase with a strap-handle (fig. 5). The fabric of the pot, including the weak red slip, agrees with the general character of the contemporary pottery.

Period III

In contradistinction to the pottery from the earlier levels, the pottery of this Period is definitely crude and ill-fired, representing a degenerate industry. Though there are very

[1] *Ancient India*, no. 1 (1946), pp. 55ff.

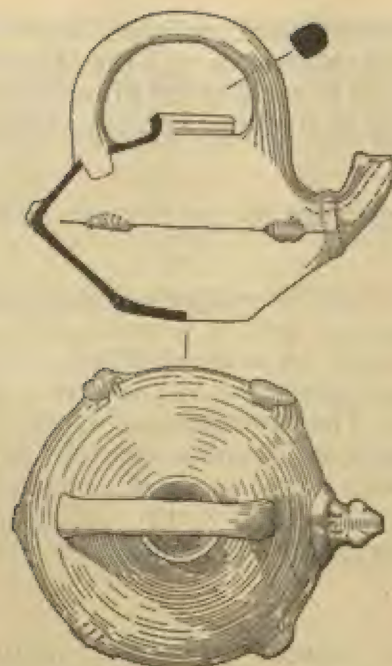


FIG. 5. *Handled and spouted vase from Śiśupālgarh, Period IIB.* ½

few typological changes, the fabric and firing have undergone a marked decline. The polished bright or weak red slip of the preceding levels is now replaced by a thin slip or wash of red or yellowish ochre. Incised decorations have become less frequent but follow the same patterns. Their execution, however, on cruder ware gives a weaker effect. A few rouletted sherds of coarse grey fabric, obtained from this Period, are presumably local imitations of the imported ones. Black-and-red ware is totally absent from this Period.

(iii) SELECT EXAMPLES

A representative collection of pots and sherds from the various Periods of the Śiśupālgarh culture is here illustrated; an exhaustive classification will be published in the final report.

Figs. 6 and 7

1. Bowl or lid of greyish black ware with inner central knob. The type occurs in all Periods and is characteristic of Śiśupālgarh ceramics. It exists (to a very restricted extent) also in red ware which varies from bright red in Period IIA to weak red in Period III. In a fairly large number of examples concentric grooves are also seen round the central knob (fig. 8, 12). See also pl. XLVI B.
2. Bowl of dull red ware with incurved rim and sides tapering to a restricted disc-base; from a middle level of Period IIA. Slight modifications of this type, however, occur in all the Periods.
3. Variant of the above from the same level.
4. Shallow bowl with sharpened rim and disc-base; from a middle level of Period IIB.
5. Fragment of a bowl of polished black ware with thin sharpened rim and triangular graffito on the exterior; from an early level of Period IIA. Bowls of this type, with variants but without graffito, occur in all the Periods.
6. Bowl of polished black ware with sharpened and slightly everted rim and flattened base; from an early level of Period I.



A. *Ring-well in the Habitation Area (SP I)*



B. *Baked plano-convex bricks in the ruins of the superstructure of the Gateway (SP IV)*



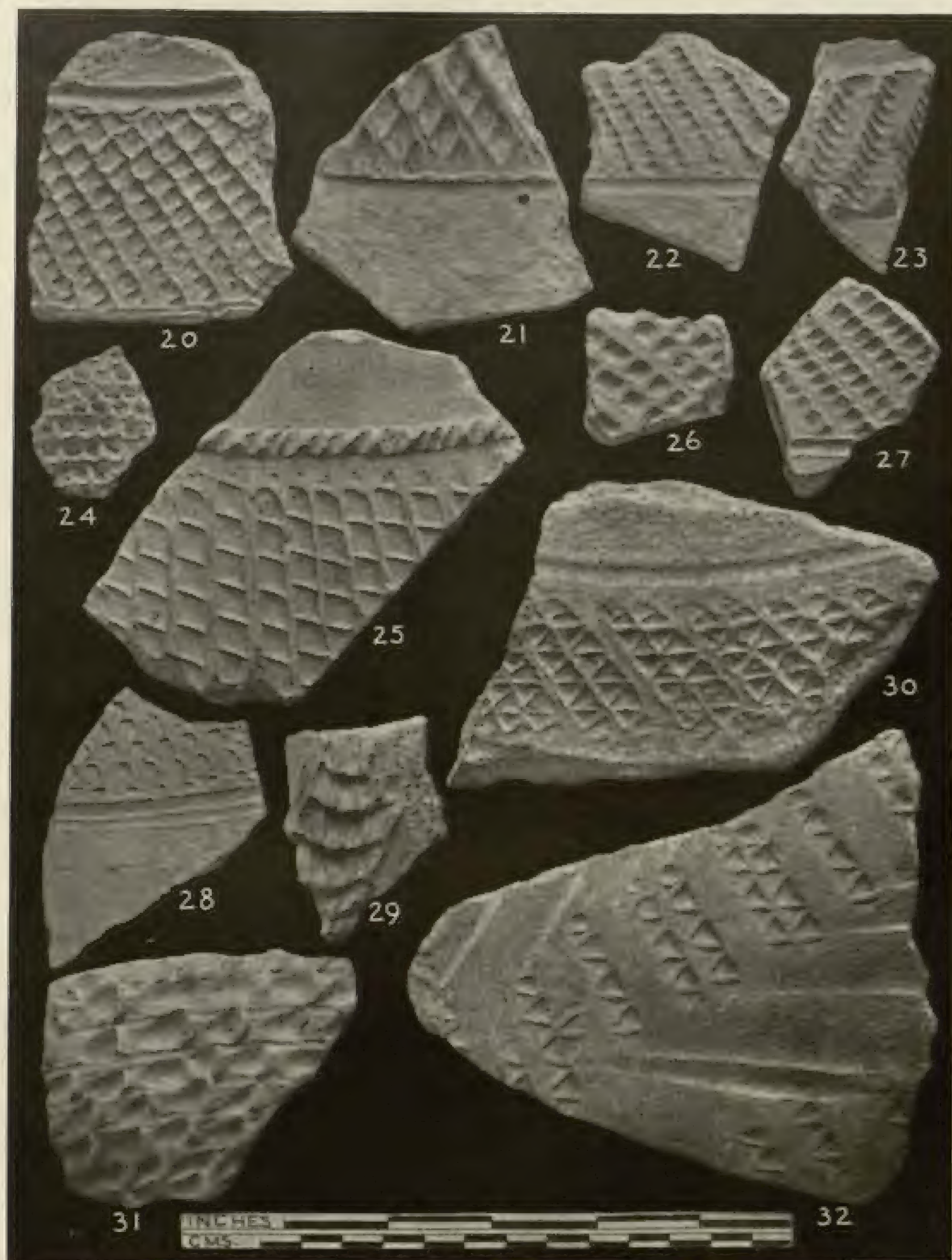
Rouletted ware



Decorated pottery



Decorated pottery



Decorated pottery

To face page 81



B. *Knobbed ware*



A. *Incised and stamped pottery*

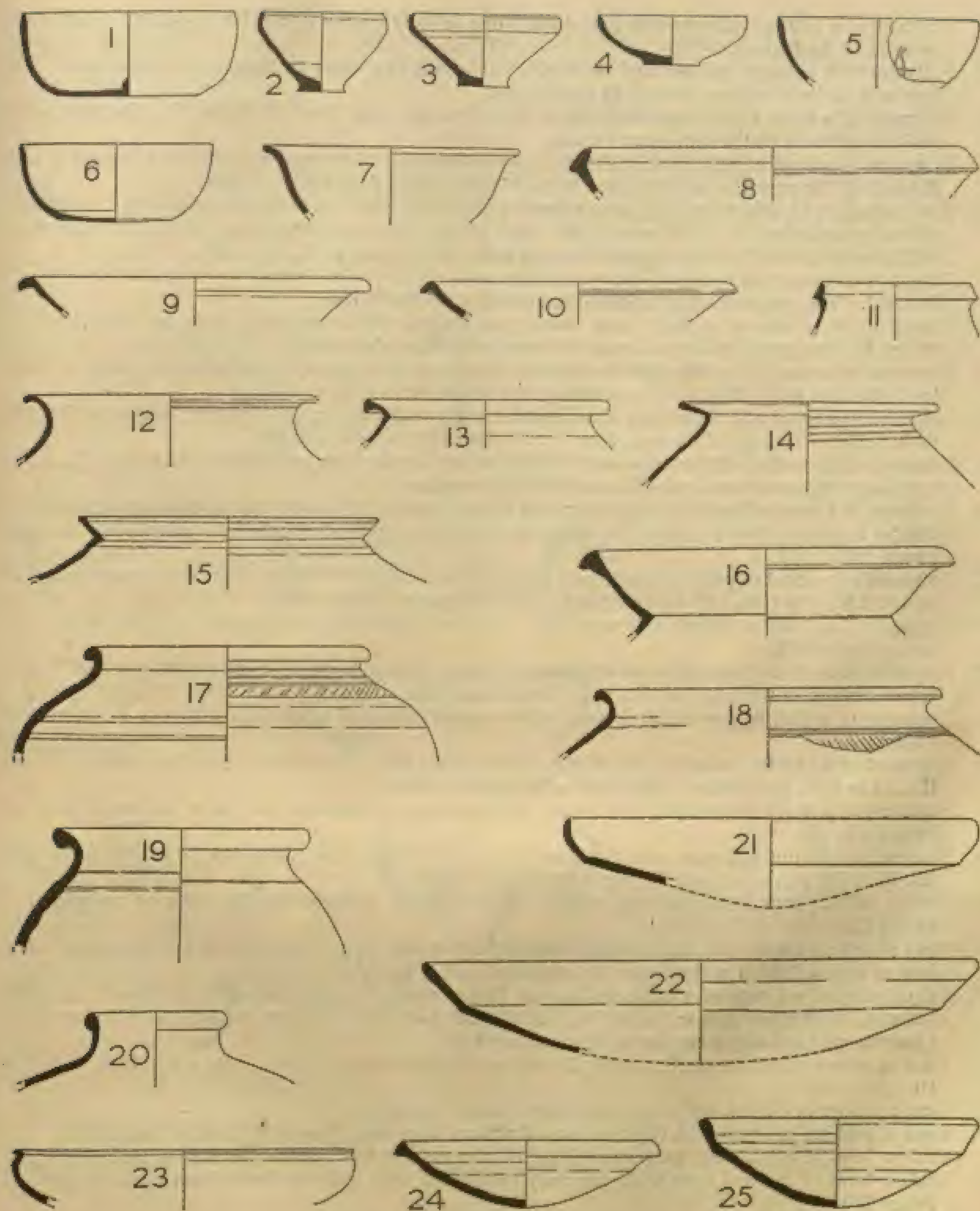


FIG. 6. *Pottery from Śiśupālgarh.* ¼

7. Fragment of a bowl of red ware with flaring rim; from an early level of Period IIB. Variants of this type occur in all the Periods.
8. Fragment of a basin of red polished ware with nail-headed rim; from an early level of Period I. The type with variants survives through all the Periods.
9. Fragment of a basin of red ware with everted rim; from an early level of Period I. The type with variants occurs in all the subsequent Periods.
10. Fragment of a bowl of grey ware with externally beaked rim. The type is peculiar to Periods I and IIA only. The present example belongs to the earliest level of Period IIA.
11. Rim-fragment of a vase of dull red ware externally chamfered; from an early level of Period I. Variants of the type continue to occur even in the upper levels. Analogues come from Ahichchhatrā, stratum VIII, ascribable to *c.* B.C. 300–200—cf. *Ancient India*, no. 1 (1946), p. 42, fig. 1, 10A.
12. Fragment of a vessel of brownish red ware with a weak rib below the flaring rim; from an early level of Period I. The type with slight modifications occurs in all the Periods.
13. Fragment of a vase of greyish black ware with beaded, out-turned rim; from an early level of Period I. Variants of this type, also in red ware, occur in all the Periods.
14. Fragment of a vessel of polished black ware with flared rim and multi-grooved shoulder; from a lower level of Period IIA. The type in red ware occurs also in Periods IIB and III.
15. Fragment of a vessel of dull red ware with flanged rim and weakly corrugated shoulder; from a late level of Period IIB. The range of the type, however, is between Periods IIA and III.
16. Fragment of a vessel of dull red ware with sharply carinated neck; from an early level of Period IIA. The type, however, starts from Period I and continues throughout.
17. Fragment of a vessel of polished black ware with everted rim and boldly grooved shoulder distinguished by oblique incisions; from an early level of Period IIA. The type with similar decorations also occurs in Period IIB.
18. Fragment of a vessel of polished black ware with oblique incisions on the shoulder; from an early level of Period IIA. The type, with modifications, continues right up to Period III.
19. Fragment of a vessel of pinkish buff ware with out-turned, beaded rim and grooved shoulder; from a late level of Period IIA.
20. Fragment of a vessel of dull red ware with beaded rim and vertical shoulder; from a middle level of Period III. The type, however, exists even in Periods IIA and IIB.
21. Fragment of a dish of greyish black ware with incurved sides and sagger base; from an early level of Period IIA.
22. Fragment of a bluntly carinated dish of grey ware; from a pit contemporary with a late level of Period IIA. The type, in red ware, occurs also in Periods IIB and III.
23. Fragment of a bowl of polished black ware, distinguished by undercut rim; from an early level of Period IIA.
24. Shallow bowl of dull red ware with thickened rim and rounded base. The type is present in Periods IIA-III. The present example is from a late level of Period III.
25. Variant of the above, with internally collared rim and bluntly carinated profile; from an early level of Period IIB.
26. Bowl of dull grey ware with vertical rim; internally corrugated sides narrowing to a flat base; from a late level of Period IIB. The type, however, continues even in Period III.
27. Lid of polished red ware with expanded rim and flanged waist; from the same level as above. The type, however, starts quite early in Period IIA. Similar lids have been found at Arikamedu, Brahmagiri and Chandravalli [1] and date from first to third century A.D.
28. Same as above except for the featureless lip and internally corrugated sides; from a late level of Period III.
29. Same as above in pinkish buff ware; from a late level of Period IIA.
30. Bowl of polished red ware with thick out-turned rim and ring-base; from a late level of Period IIB.
31. Shallow bowl of reddish buff ware with splayed out rim and flat base; from a late level of Period IIB.
32. Shallow bowl of dull red ware with internally corrugated sides and disc-base; from a middle level of Period IIB.

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[1] *Ancient India*, no. 2 (1946), p. 67, fig. 23; no. 4 (1947-48), p. 240, fig. 28 and p. 283, fig. 48.

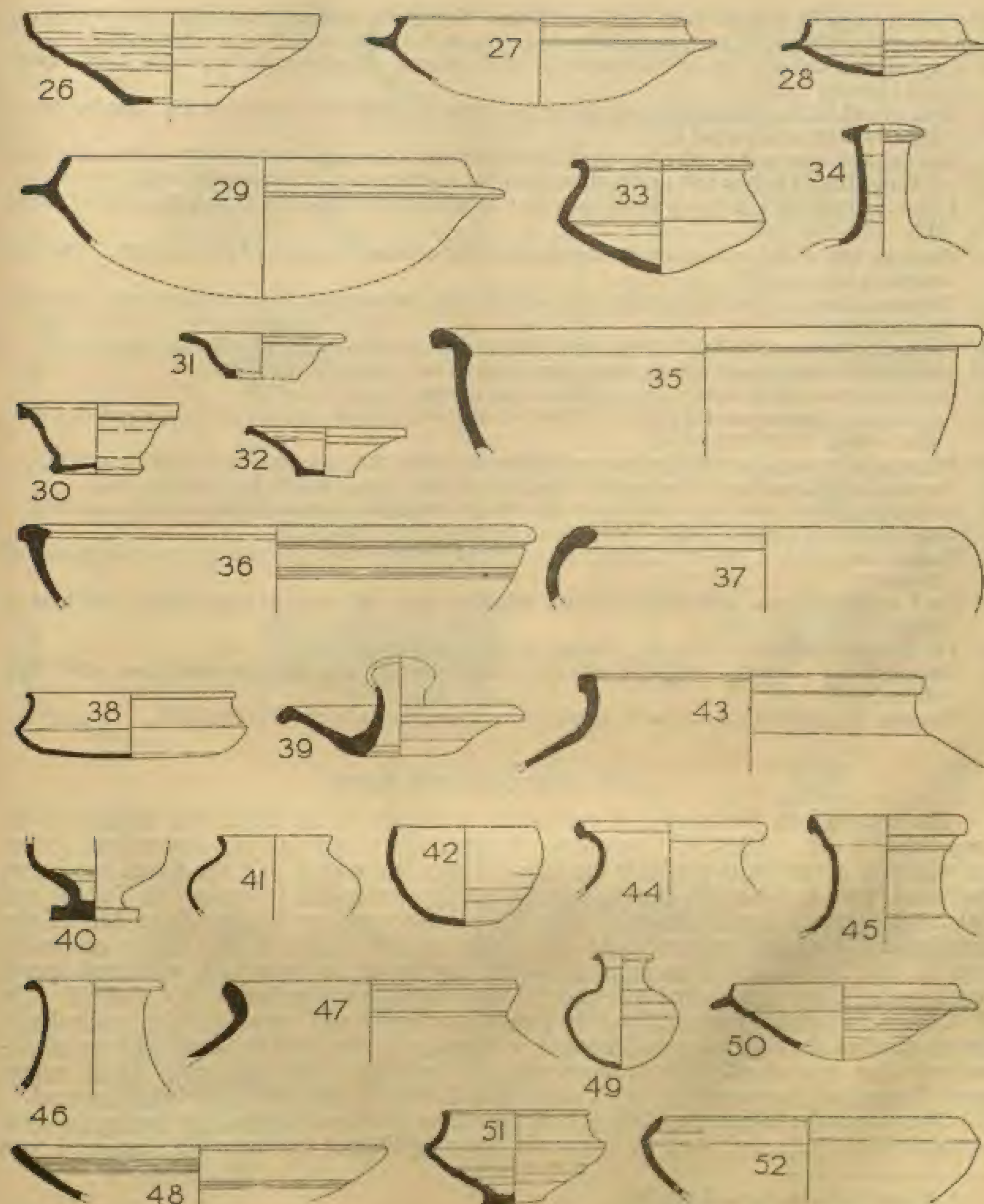


FIG. 7. *Pottery from Śiśupālgarh.* $\frac{1}{4}$

33. Carinated vase of dull red ware with everted rim. Though the specimen illustrated here is from an early level of Period III, the type both in red and grey ware also occurs in Periods IIA and IIB.
34. Fragment of a unique bottle-necked vessel of polished red ware with grooves in the interior; from a lower level of Period IIA.
35. Basin of dull red ware with thickened flaring rim; from a middle level of Period III. Similar basins also exist in Periods IIA and IIB.
36. Basin of buff ware with nail-headed rim externally grooved; from a pit contemporary with a late level of Period IIB. The type with modifications, however, is present in all the successive levels.
37. Fragment of a vessel of bright polished red ware with incurved thickened rim; from a late level of Period IIB.
38. Carinated vase of dull red ware with imperfectly flat base; from a middle level of Period IIB. The type continues in Period III.
39. Fragment of a lid of brownish red ware with internal knob (reconstructed from roughly similar examples at Arikamedu).[1]
40. Fragment of a vase of pinkish buff ware with pedestal-base; from an early level of Period IIB.
41. Small vase of dull red ware with featureless rim; from an early level of Period IIB.
42. Bowl of grey ware with slightly sharpened rim; from an early level of Period IIB.
43. Fragment of a unique vessel of brownish red ware with thick, internally beaked rim and ledged shoulder; from a middle level of Period IIB.
44. Fragment of a vase of brownish red ware with internally ledged rim; from an early level of Period IIA.
45. Fragment of a unique long-necked vessel of pinkish buff ware; from a middle level of Period IIB.
46. Neck-fragment of a vessel of polished red ware with out-turned rim; from a middle level of Period IIB.
47. Rim-fragment of a vase of dull red ware; from an early level of Period III.
48. Fragment of a dish of grey ware, heavily grooved both internally and externally; from an early level of Period III.
49. Small vase of red ware with out-turned rim, ledged shoulder and rounded base; from a late level of Period III.
50. Lid of red ware with short vertical lip; from a middle level of Period III.
51. Carinated vase of greyish buff ware with internally corrugated sides and disc-base; from a late level of Period III.
52. Fragment of a basin of red ware with sharply incurved rim; from a late level of Period III.

(iv) Black-and-red ware

The excavations produced a fair number of sherds of the distinctive black-and-red 'megalithic' fabric. Most of these are too fragmentary to indicate any determinate shape, but wherever a section is available the type has been illustrated. Of the eleven specimens illustrated, nos. 1, 7 and 11 (fig. 8) approximately correspond to types C8, T88-89 and T90 respectively of the Brahmagiri Megalith culture[2] and no. 9 (fig. 8) to M8 of the Chandravalli Megalith culture.[3] At SP I, the earliest sherd of this fabric occurs in layer 20 (fig. 2). In the same section, 10 feet higher up, in layer 12A, rouletted sherds were found. The range of the black-and-red ware sherds is within Periods IIA and IIB. On SP II the ware is entirely absent from the pre-defence layers and occurs only sporadically in the top stuff of the clay-rampart (Phase I), indicating thereby that the arrival of the black-and-red ware was roughly synchronous with the building of the defences. In all subsequent Phases and the successive levels associated therewith, the ware is fairly represented.

The date of the Indian megaliths is still a problem to archaeologists, but during the 1947 excavations at Brahmagiri and Chandravalli, the megaliths of that area were assigned to a

[1] *Ancient India*, no. 2, p. 67, fig. 23.
[2] Ibid., no. 4 (1947-48), pp. 207ff.
[3] Ibid., pp. 274–7.

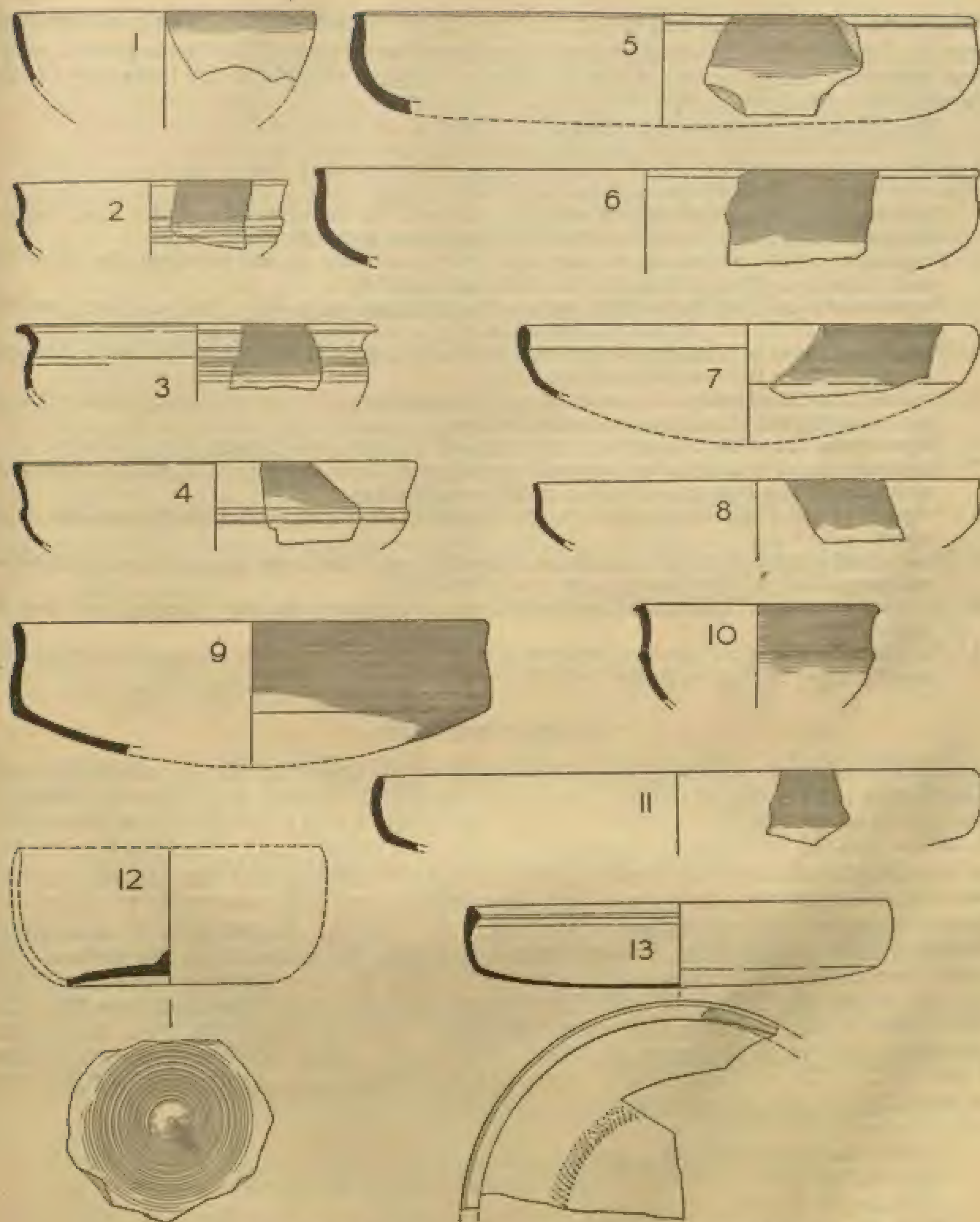


FIG. 8. 1–11, *black-and-red ware* ; 12, '*knobbed*' *ware* ; 13, *rouletted ware*. ⅓

period between *c.* 200 B.C. and the first half of the first century A.D.[1] The black-and-red ware at Śiśupālgarh seems to represent a northward extension of the same general ware from the south and its arrival at this site may be assigned roughly to the beginning of the second century B.C.

The following represent the range of the types:—

Fig. 8

1. Fragment of a bowl of black-and-red ware with sharpened rim and apparently rounded base, roughly comparable to Brahmagiri megalithic type C8 [2]; from a lower level of Period IIA.
2. Fragment of a bowl of black-and-red ware with slightly out-turned rim and prominent ribs below the neck; from the make-up of Phase II of the Defences, Period IIA.
3. Fragment of a bowl of black-and-red ware with everted rim and multi-grooved shoulder; from the make-up of the clay-rampart, Phase I, Period IIA.
4. Fragment of a bowl of black-and-red ware with flat rim and prominent cordon round the body; from the make-up of Phase III of the Defences, Period IIA.
5. Fragment of a dish of black-and-red ware, externally grooved below the rim and distinguished by thicker section and flat base; from the same deposit as above.
6. Fragment of a dish of black-and-red ware apparently with flat base; from the same deposit as above.
7. Fragment of a dish of black-and-red ware with internally collared rim and sagger base, roughly comparable to Brahmagiri megalithic type T88-89 [3]; from the same deposit as above.
8. Fragment of a dish of black-and-red ware, distinguished by its concave sides; from the same deposit as above.
9. Fragment of a carinated dish of black-and-red ware with low girth and sagger base, analogous to Chandravalli megalithic type M8 [4]; from an upper level of Period IIB.
10. Fragment of a bowl of black-and-red ware with a weak cordon round the body; from an upper level of Period IIB.
11. Fragment of a dish of black-and-red ware with incurved sides and sagger base, comparable to Brahmagiri megalithic type T90 [5]; from the top level of Period IIB.

(v) Rouletted ware

Sherds with the rouletted pattern provide one of the important data by which the local Śiśupālgarh pottery can be dated. This ware was first discovered at Arikamedu, where it lay in association with the imported Arretine ware (from which it seems to have derived the rouletted pattern) belonging to the first half of the first century A.D. The fabric and form of the Śiśupālgarh rouletted sherds show unmistakable identity with the known rouletted ware from Arikamedu, Brahmagiri and Chandravalli, and it is reasonable to assign the lowest examples from Śiśupālgarh to *c.* A.D. 50. In the limited area of excavation, however, only seventeen sherds were obtained, besides three found on the surface. Of these, two each were obtained from sites SP IV (the Western Gateway) and SP II (the Cutting across the Defences). Of the remaining thirteen sherds recovered from SP I (the Habitation Area), no fewer than nine were from layers 7 and 6 (fig. 2), a deposit representing an overall thickness of 3 feet. The earliest piece, however, came from level 12A (fig. 2). The three specimens from the upper levels have an inferior grey fabric and presumably are of local manufacture.

[1] *Ancient India*, no. 4 (1947-48), p. 202.
[2] Ibid., p. 210, fig. 9.
[3] Ibid., p. 233, fig. 24.
[4] Ibid., p. 275, fig. 43.
[5] Ibid., p. 233, fig. 24.

All the sherds bearing the rouletted pattern are listed below:—

Pl. XLII

1. Sherd with two concentric bands of rouletted pattern, the outer being diamond-shaped; from an upper level of Period IIA (layer 12A of fig. 2).
2. Sherd with two concentric bands of rouletted pattern; from a middle level of Period IIB (layer 8 of fig. 2).
3. Sherd with two concentric bands of rouletted pattern; from the top level of Period IIB (layer 7 of fig. 2).
4. Sherd with one band of rouletted pattern; from a level associated with Phase III of the Defences, Period IIA.
5. Sherd with one band of rouletted pattern; from a pit contemporary with the top level of Period IIB (layer 7 of fig. 2).
6. Sherd with a thin band of rouletted pattern; from the same level as no. 3.
7. Sherd with one band of rouletted pattern; from a level associated with Period IIB at the Gateway.
8. Sherd with one band of rouletted pattern; from the same level as no. 3.
9. Sherd with two concentric bands of rouletted pattern; from a level associated with Phase III of the Defences, Period IIA.

10-11. Sherds, each with a single band of rouletted pattern; from an early level of Period III (layer 6 of fig. 2).

12. Sherd with one band of rouletted pattern; from a level associated with Period IIB at the Gateway.
13. Dish with incurved sides having a band of weak rouletted pattern corresponding to Arikamedu Type 1[1]; from the same layer as nos. 10 and 11 (also fig. 8, 13).
14. Sherd with one band of weak rouletted pattern; from the same level as no. 3.
15. Sherd with one band of rouletted pattern; from a middle level of Period III (layer 5 of fig. 2).
16. Sherd with one band of rouletted pattern; from a middle level of Period III (layer 4 of fig. 2).
17. Sherd with one band of rouletted pattern; from the penultimate level of Period III (layer 2 of fig. 2). It is a stray find.

18–20. Sherds bearing one band of rouletted pattern; collected from the surface.

Fig. 8

13. Same as no. 13 above.

(vi) Decorated sherds

The following plates illustrate the range of incised and applied decorative patterns on Śiśupālgarh pottery. As stated above, decoration is entirely absent in Period I, thereafter it is common in all levels but shows the greatest frequency in Period IIA. The principal patterns include incised oblique combings, oblique slashings, applied bands of finger-tip or cord-pattern and rectangular notches arranged in oblique rows.

Pl. XLIII

1. Red-slipped sherd, decorated with oblique slashes; from Period IIA. The pattern is common to Periods II and III.
2. Dull red-slipped sherd with oblique slashes, a variation of the above; from Period III.
3. Dull red-slipped sherd decorated with an applied band of finger-tip pattern; from Period IIA. The pattern is common to Periods II and III.
4. Red-ochre-slipped sherd with two applied bands of cord interspersed with finger-tip pattern; from Period III. The pattern is common to Periods II and III.
5. Buff-slipped sherd with finger-tip and chain pattern; from Period IIA. The pattern is common to Periods II and III.
6. Red-slipped sherd with finger-tip enclosed by two rows of cord-pattern; from Period IIA.
7. Rim of red-slipped vessel with zig-zag pattern in relief; from Period IIB.

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[1] *Ancient India*, no. 2 (1946), pp. 45ff.

8. Sherd of black ware decorated with triangular notches; from Period IIA. The pattern is common to Periods II and III.
9. Dull red-slipped sherd with three rows of long chain and finger-tip pattern; from Period IIB.
10. Red-slipped sherd with triangular incisions; from Period IIA. The pattern is common to Periods II and III.
11. Polished red-slipped sherd with faint oblique combings; from Period IIA. The pattern is common to Periods II and III.
12. Red-slipped sherd decorated with incised ladder-pattern; from Period IIA. The only example recovered.

Pl. XLIV

13. Fragment of a dish of coarse red ware, the rim being decorated with incised oblique and vertical lines; from Period IIB.
14. Rim of a vase of red ware, decorated with horizontal rows of oblique notches on the body; from Period IIA.
15. Sherd decorated with incised criss-cross pattern on the rim; from Period IIB.
16. Fragment of a vase of red ware, decorated with bands of elongated finger-tip pattern; from Period IIB.
17. Sherd of red ware with horizontal rows of notches; from Period IIA.
18. Fragment of a vase of red ware decorated in relief with a horizontal row of star-pattern enclosed in circles below a raised band of nail-tip impressions; from Period IIB. The only example recovered.
19. Red-ochre-slipped sherd decorated with conventionalized floral pattern below a horizontal band of notches; from Period III. The only specimen recovered.

Pl. XLV

20. Red-slipped sherd decorated with rectangular notches arranged in oblique rows; from Period IIB. The pattern is common to Periods II and III.
21. Same as above with bigger rectangles; from a middle level of Period IIA.
22. Variation of the rectangular notch pattern; from a middle level of Period IIA.
23. Red-slipped sherd decorated with raised bands interspersed with oblique indentations; from a middle level of Period IIA.
24. Red-slipped sherd decorated with horizontal rows of incised loop-pattern; from Period IIB.
25. Red-slipped sherd decorated with raised oblique bands enclosing rectangles below a horizontal applied band of cord-pattern; from the make-up of Phase III of the Defences, Period IIA.
26. Red-slipped sherd decorated with raised oblique bands enclosing rectangles; from the make-up of Phase III of the Defences, Period IIA.
27. Yellow-ochre-slipped sherd decorated with oblique rows of oval notches; from an early level of Period III.
28. Red-slipped sherd decorated with incised loops arranged in oblique rows; from a middle level of Period IIA.
29. Unique red-slipped sherd decorated with indented, superimposed bands; from a middle level of Period IIA.
30. Red-slipped sherd decorated with triangles enclosed by oblique bands; from a late level of Period IIA.
31. Red-slipped sherd decorated with nail-tip indentations arranged in horizontal rows; from a late level of Period IIA.
32. Red-slipped sherd decorated with grouped bands of triangles relieved by incisions; from an early level of Period IIA.

Pl. XLVI A

1. Neck-fragment of a vase of dull red ware decorated with incised floral pattern; from a middle level of Period IIB.
2. Sherd of dull red ware decorated with a ram in relief amidst grouped verticals; from a middle level of Period III.
3. Sherd of dull red ware decorated with an elephant in relief (probably stamped); from a middle level of Period III.

(vii) 'KNOBBED' WARE (figs. 6, 1 and 8, 12; pl. XLVI B)

As stated earlier (p. 79), the 'knobbed' ware—lid-cum-bowl with inner central knob usually circumscribed by a series of concentric grooves or incisions—constitutes a distinctive pottery-type at Śiśupālgarh. With the exception of a few examples in red in Periods IIA and III, the ware is grey or greyish black, polished in the earlier levels and sometimes also salt-glazed. The type, with or without grooves, occurs in all the Periods. Whereas the form remains the same throughout, the fabric follows the character of the other contemporary pottery. In the upper levels it becomes quite crude, has an inferior finish and mostly lacks the slip. The vessel has usually a flat base, but instances of omphalos bases have also been observed (fig. 8, 12). The grooves around the central knob are in some cases quite bold, while in the others they are mere incisions.

9. OTHER FINDS[1]

(i) GENERAL

Other finds from the excavation include over one hundred and eighty beads—variously of carnelian (etched in one instance), onyx, agate, chalcedony, amethyst, glass, terracotta and copper—eight terracotta seals and sealings, two coin-moulds, sixteen bone stili, nine moulded clay *bullae* and personal ornaments comprising twelve terracotta pendants, one hundred and forty-eight terracotta ear-ornaments (besides one of lead), nine finger-rings and twenty-eight bangles of terracotta, copper, ivory, bone and glass. The occurrence of glass bangles, of which nine fragments were recovered, was confined to Periods IIB and III. Their introduction to the site, therefore, presumably took place towards the end of the second century A.D.[2]

Over half a dozen antimony-rods, a miniature blow-pipe, and a pin, all of copper, were also recovered, besides iron implements of both peace and war—notably knife-blades, sickles, nails, spikes, ferrules, caltrops, daggers, spear- and arrow-heads, etc. An interesting find from the Habitation Area was that of an ivory spacing bead with elaborate carving showing on one side a lotus flanked by a couple of swans, and on the other three lotuses (pl. XLIX B).

The present report deals only with ear-ornaments, iron objects, coins and coin-moulds and clay *bullae*. Other objects will be dealt with in the final report.

(ii) EAR-ORNAMENTS

Ear-ornaments are prolific at Śiśupālgarh. But for a single exception of lead,[3] they are invariably of terracotta. This predilection for terracotta, however, cannot be overemphasized since it is probable that ear-ornaments of other materials have not been obtained in the limited extent of the dig. Possibly some of them had a thin metal plating or gilding, but the available examples do not bear any such indication.

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[1] This section has been prepared mainly by Mr. B. K. Thapar under my general guidance.

[2] Under closely-observed stratification, glass bangles were recovered during the 1945 excavations at Sirkap (Taxila II) from a pit between Phases I and II (50 B.C.—A.D. 50) and during the 1947 excavations from the Āndhra levels both at Brahmagiri and Chandravalli (A.D. 50–200). Cf. *Ancient India*, no. 4 (1947-48), pp. 80 and 263 respectively. In both the cases the evidence does not show the regular use of glass bangles earlier than the beginning of the Christian era.

[3] Lead ear-ornaments are heavier than their counterparts in other materials. They are generally used for distending ear-lobes—a practice which continues even today in several parts of India.

The excavation has yielded one hundred and forty-eight terracotta ear-ornaments. Of these, as many as one hundred and two were recovered only within three to four feet from the surface, in levels associated with the Late Period, during which time they seem to have assumed great popularity, forty-two from Period IIB and the remaining four from the upper levels of Period IIA (second quarter of the first century A.D.).

The ear-ornaments have been made from piece-moulds of such fine edges that no seam is distinguishable. No example of these moulds was, however, discovered. In general agreement with the respective pottery, the ear-ornaments from the lower levels are well-fired and have buff or bright red slip, while those from the upper ones are treated with red-ochre wash. The principal motifs of decoration include concentric circles, raised bands, conventionalized floral patterns and spiral incisions, the first being predominant.

The ear-ornaments fall into the following broad types:

Type I (seventy-two examples): resembles a games-head, having a cylindrical stalk, conical terminal and a disc-like upper edge. Similar ear-ornaments are noticed on the female chauri-bearer from Didārganj (Patna),[1] the Amarāvatī sculptures,[2] the Bacchanalian group from Maholi,[3] the Yaksha Dampati with parrot from Mathurā[4] and the sculptures on the railings from Bhūteśvara.[5]

Type II (thirteen examples): wheel-shaped, with a shallow groove round the edge. Two of the examples are perforated through the centre, while six of them are decorated on both sides. The type is represented on the Sārnāth,[6] Amarāvatī[7] and Mathurā[8] sculptures.

Type III (twenty-seven examples): bicone, with a sharp deep groove in the middle. Variant IIIA (one example) has a shallow concave groove. The type is roughly similar to some ear-studs found at Harappā.[9]

Type IV (five examples): reel-shaped. Analogies come from Rairh (Jaipur)[10] and Kosam (Allahabad).[11]

Type V (twenty-nine examples): crescent-shaped. Identical ear-ornaments exist on Amarāvatī[12] and Mathurā[13] sculptures.

Type VI (two examples): oblong, with a shallow groove round the edges.

Of these, types I–IV are present in Periods IIA, IIB and III; type V in Periods IIB and III; while type VI is confined to Period III only.

From the sculptural representations cited above, it is evident that types I–IV were fitted into the split ear-lobe. The same might be said of type VI. The crescent could be attached to the lobe by a hook or similar other thing.

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[1] L. Bachhofer, *Early Indian Sculpture* (New York, 1927), I, p. 19.

[2] C. Sivaramamurti, 'Amarāvatī Sculptures in the Madras Government Museum', *Bulletin of the Madras Government Museum* (Madras, 1942), pp. 108–110, pl. VIII, 3.

[3] V. S. Agrawala, *Handbook of the Sculptures in the Curzon Museum of Archaeology, Muttra* (Allahabad, 1939), pl. XI, 24.

[4] Ibid., pl. XIV, 28.

[5] Ibid., pl. XVI, 32.

[6] *An. Rep. Arch. Surv. Ind.*, 1914-15, pl. LXV, *a*, *f* and g.

[7] C. Sivaramamurti, op. cit., pl. VIII, fig. 1.

[8] V. S. Agrawala, *A short Guide to the Archaeological Section of the Provincial Museum, Lucknow* (Allahabad, 1940), pl. IX, 9.

[9] M. S. Vats, *Excavations at Harappā* (Delhi, 1940), I, p. 446 and II, pl. CXXXIX, 26–28.

[10] K. N. Puri, *Excavations at Rairh* (Jaipur), pp. 41-42 and pl. XII, *e*.

[11] Unpublished, Kosam excavations, 1949.

[12] C. Sivaramamurti, op. cit., pl. VII, 7 and 10, pl. VIII, 5 and pl. IX, 4.

[13] V. S. Agrawala (1939), op. cit., pl. IX, 21.

The following is a detailed description of selected ear-ornaments:

Pl. XLVII

1. *Type I.* The conical portion as well as the flat end are decorated with concentric circles; from an early level of Period IIB. (SP IV-10.)
2. *Type I.* In contradistinction to the above, it has a slightly convex upper end and a frill of appliqué work round the base of the conical end; from a middle level of Period IIB. (SP IVF-34.)
3. *Type I.* Distinguished by a shorter stalk and foliate patterns both on the flat and conical ends; from a lower level of Period III. (SP I-354.)
4. *Type II.* Plain, having a prominent groove round the edges; from a late level of Period IIB. (SP IVC-15.)
5. *Type II.* Same as above with the addition of a central perforation; from a late level of Period III. (SP II-48.)
6. *Type II.* Decorated with petals circumscribed by a cabled border; from a late level of Period III. (SP I-300.)
7. *Type II.* Decorated with conventionalized rosette-pattern with a plain border; from an upper level of Period IIA. (SP II-206.)
8. *Type II.* Decorated with twine-pattern round a slightly raised knob; from a late level of Period III. (SP IVF-16.)
9. *Type III.* The conical ends are decorated with concentric circles; from an upper level of Period IIA. (SP II-399.)
10. *Type III.* Plain, with a shallow groove; from a late level of Period III. (SP I-334.)
11. *Type IV.* The flat ends are decorated with concentric rings; from an early level of Period IIB. (SP II-182.)
12. *Type IV.* Lead, coiled from a thin ribbon and hammered at either end, with a longitudinal hole; from a late level of Period III. (SP I-277.)
13. *Type V.* Each face decorated with raised bands at the ends; from a middle level of Period IIB. (SP II-337.)
14. *Type V.* Each face decorated with a row of beads; from an upper level of Period IIB. (SP II-300.)
15. *Type V.* Each face decorated with raised bands and crescentic rows of beads; from a middle level of Period IIB. (SP II-314.)
16. *Type V.* Each face decorated with a crescentic row of beads above simple lines; from a late level of Period III. (SP I-301.)
17. *Type V.* Each face decorated with a spiral pattern; from a late level of Period III. (SP II-286.)
18. *Type V.* Each face decorated with raised bands and crescents; from a middle level of Period IIB. (SP II-156.)
19. *Type VI.* Decorated with indentations in U-shape surmounted by a boss at either end; from a late level of Period III. (SP II-14.)

(iii) Iron objects

The excavation has yielded one hundred and ninety-seven iron objects, besides a number of shapeless and indeterminate bits. They include nails, spikes, staples, sickles, ferrules, knife-blades, borers, lances, spear-heads, tanged daggers, barbed and faceted arrow-heads and caltrops. As might be expected, a vast majority of these objects, specially those used as weapons of war, came mainly from the trenches across the defences and the gateway. A notable find is that of caltrops (fig. 10, 32), which have been recovered in India for the first time. They were used to obstruct the progress of the enemy by laming his horses and elephants. Caltrops occur on the Roman military sites of the early centuries A.D. in western Europe and are, therefore, of a comparable period.[1]

[1] The use of caltrops was revived in the early stages of the First Great War of 1914–18 when cavalry was reintroduced. Furthermore, similar objects were included in bombs dropped on sites in the Middle East

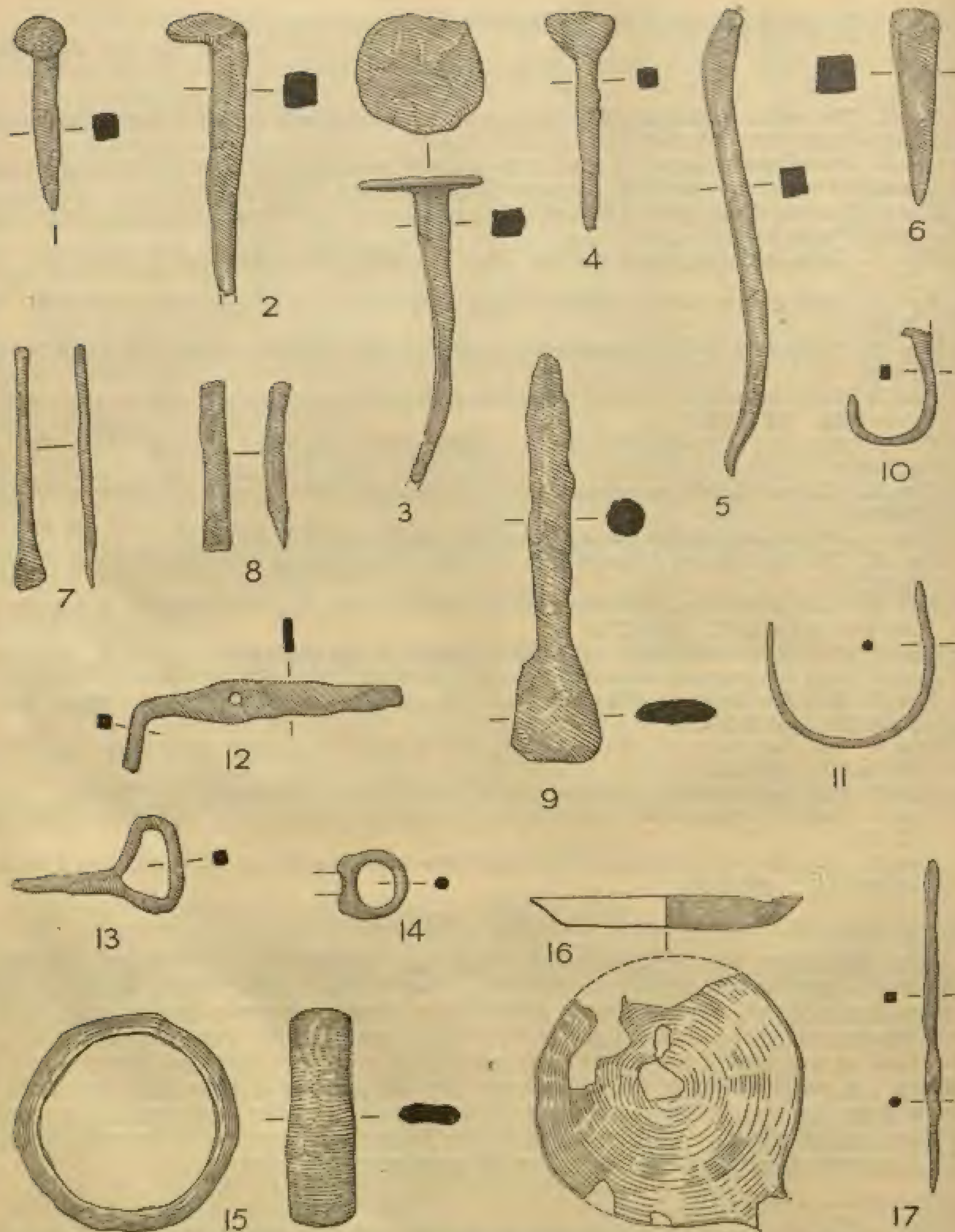


FIG. 9. *Iron implements.* ½

No iron object was obtained from the levels belonging to Period I; but this absence may be largely due to the fact that digging in the lowest levels was confined to a very small area. Periods IIA and IIB yielded a fair number of objects, while Period III yielded the largest.

The selected specimens are listed below:—

Figs. 9–11

1. Nail of squarish section with knob-head; from the late accumulations outside the northern gateway-flank, Period III. (SP IVG-1.)
2. Nail of square section with a flat hook-head; from the accumulations outside the southern gateway-flank, late level of Period III. (SP IVA-19.)
3. Nail of square section with flat circular head; from the débris overlying the ancillary passage, late level of Period III. (SP IVS-8.)
4. Nail of square section with expanded triangular head; from the accumulations contemporary with Phase III of the defences, Period IIB. (SP II-407.)
5. Spike of square section, bent; from the make-up of Phase III of the defences, Period IIA. (SP II-424.)
6. Nail of square section tapering to a pointed end; from the accumulations outside the northern gateway-flank, middle level of Period IIB. (SP IVF-10.)
7. Object of indeterminate use (probably a nail-cutter) with flattened lower end; from the accumulations contemporary with Period IIB at the gateway. (SP IVN-2.)
8. Chisel of oblong section; from the accumulations outside the southern gateway-flank, upper level of Period III. (SP IVA-12.)
9. Implement with long tang and flattened broad edge, probably a chisel; from an early level of Period IIB. (SP I-15.)
10. Fragment of a hook (probably a fish-hook); from the débris overlying the ancillary passage, late level of Period III. (SP IVS-27.)
11. Fragment of a hook (or bangle?) with thin circular section; from the accumulations contemporary with late levels of Period III. (SP IV-35.)
12. Latch, with provision for a central nail; from the accumulations outside the northern gateway-flank, Period III. (SP IVD-19.)
13. Staple; from the accumulations contemporary with Period III of the defences. (SP II-191.)
14. Fragment probably of a staple; from a pit contemporary with the late levels of Period IIB. (SP II-369.)
15. Ring of roughly oblong section; from a middle level of Period III. (SP I-53.)
16. Shallow dish (probably part of a ladle) of thin section with flat base; from the accumulations outside the northern gateway-flank, late level of Period III. (SP IVP-8.)
17. Borer; from the accumulations outside the northern gateway-flank, middle level of Period IIB. (SP IVF-22.) Similar borers have also been found at Brahmagiri.[1]
18. Arrow-head, barbed and socketed; from the late accumulations outside the southern gateway-flank, Period III. (SP IVA-59.) Analogies exist at Brahmagiri, Ādichanallūr, Savandrug and Patpād.[2]
19. Arrow-head, four-edged and tanged; from the accumulations of Period III outside the northern gateway-flank. (SP IVG-41.)
20. Arrow-head, three-edged and tanged; from the accumulations outside the southern gateway-flank, an upper level of Period III. (SP IVA-1.)
21. Elongated arrow-head, four-edged; from the accumulations of Period III at the gateway. (SP IV-55.)

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during the Second World War of 1939–45 with a view to hindering motor-transport. The idea is thus both an old and a new one. (Information from Dr. R. E. M. Wheeler.)

Kauṭilya, in his *Arthaśāstra*, also mentions similar obstacles being placed adjacently outside the rampart to impede the enemy's progress. Cf. R. Shamasastry, *Kauṭilya's Arthaśāstra*, Text (Mysore, 1924), pp. 52-3; Translation (Bangalore, 1929), p. 51.

[1] *Ancient India*, no. 4 (1947-48), pp. 260–62, fig. 40, 47.

[2] Ibid., p. 259, figs. 38, 27 and p. 260.

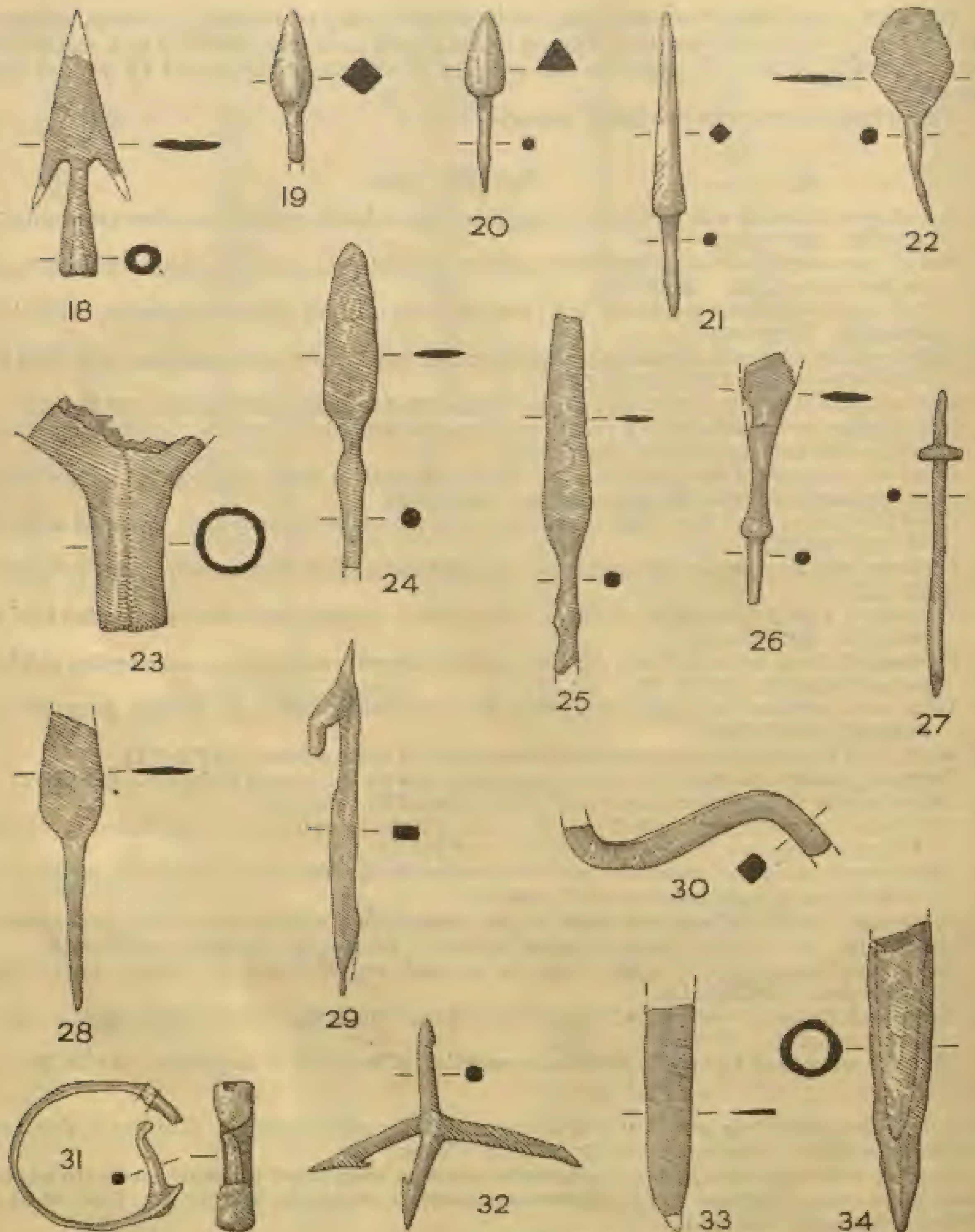


FIG. 10. *Iron implements.* ½

22. Leaf-shaped arrow-head with thin flattened section; from the late accumulations of Period III in the main passage of the gateway. (SP IVE-8.)
23. Fragment of a spear-head with fissured socket; from an upper level of Period III. (SP IVK-I.)
24. Spear-head; from the late accumulations of Period III at the gateway. (SP IV-5.)
25. Spear-head; from a deposit contemporary with Period IIB at the gateway. (SP IVK-11.)
26. Spear-head, constricted in the middle; from the accumulations of Period III outside the northern gateway-flank. (SP IVD-2.)
27. Object of indeterminate use, circular in section (probably an awl or stopper); from the late accumulations of Period III at the gateway. (SP IV-48.)
28. Spear-head; from the same deposit as no. 26. (SP IVD-10.)
29. Harpoon of oblong section; from the late accumulations of Period III at the gateway. (SP IV-7.)
30. Fragment of an indeterminate object; from the clay-rampart of Phase I at the gateway, Period IIA. (SP IV-20.)
31. A bracelet, more probably a handcuff; from the accumulations contemporary with Period IIB at the gateway. (SP IVT-2.)
32. Caltrop, consisting of four radiating spikes so arranged that whichever way the object may be thrown on the ground, one of them always projects upwards; from the accumulations outside the northern gateway-flank, late level of Period III. (SP IVG-43.)
33. Fragmentary knife-blade; from the accumulations outside the southern gateway-flank, Period IIB. (SP IVD-5.)
34. Ferrule of circular section; from the accumulations contemporary with Period IIB of the defences. (SP IV-56.)
35. Fragmentary lance of roughly circular section; from the accumulations outside the northern gateway-flank, Period III. (SP IVP-15.)
36. Hoe with tang of circular section; from the late accumulations outside the northern gateway-flank, Period III. (SP IVP-21.)
37. Sickle with tang of circular section; from a middle level of Period III. (SP I-210.) Analogies exist at Brahmagiri and other megalithic sites in South India.[1]
38. Ring of a tripod-stand, the position where the legs were rivetted being visible; from the accumulations outside the northern gateway-flank, middle level of Period III. (SP IVP-13.)
39. Ring of circular section with overlapping sharpened ends; from the make-up of Phase III of the Defences, Period IIA. (SP II-136.)
40. Flat strip of indeterminate use; from the same deposit as no. 38. (SP IVP-14.)
41. Clamp; from the same deposit as no. 30. (SP IV-54.)
42. Tanged knife or dagger; from a middle level of Period III. (SP I-363.)
43. Chopper-like object; from the same level as no. 34. (SP IV-45.)

(iv) Coins and coin-moulds[2]

A. *Coins*

Altogether thirty-one coins have come from the excavation, of which one each is of gold and silver, fourteen of lead and fifteen of copper. The gold coin, on which a note (below, p. 100) has been contributed by Professor A. S. Altekar, is a unique discovery showing the Kushan design of standing king and a Brāhmī legend in characters of *c.* third century A.D. on the obverse and a Roman head with a Roman legend on the reverse. This coin was found in the foundation-deposit of a wall in the Cutting across the Defences at SP II in a layer belonging to Period III and is datable to the middle of the third century A.D. The silver coin, of the square punch-marked variety, with a known reverse type[3]

[1] *Ancient India*, no. 4 (1947-48), pp. 259-60, fig. 38, 29-30.

[2] Contributed by Mr. K. Deva.

[3] J. Allan, *Cat. of Coins of Ancient India in Brit. Mus.* (London, 1936), pp. lxi and 28–36, pl. V, 1–3, 6-7.

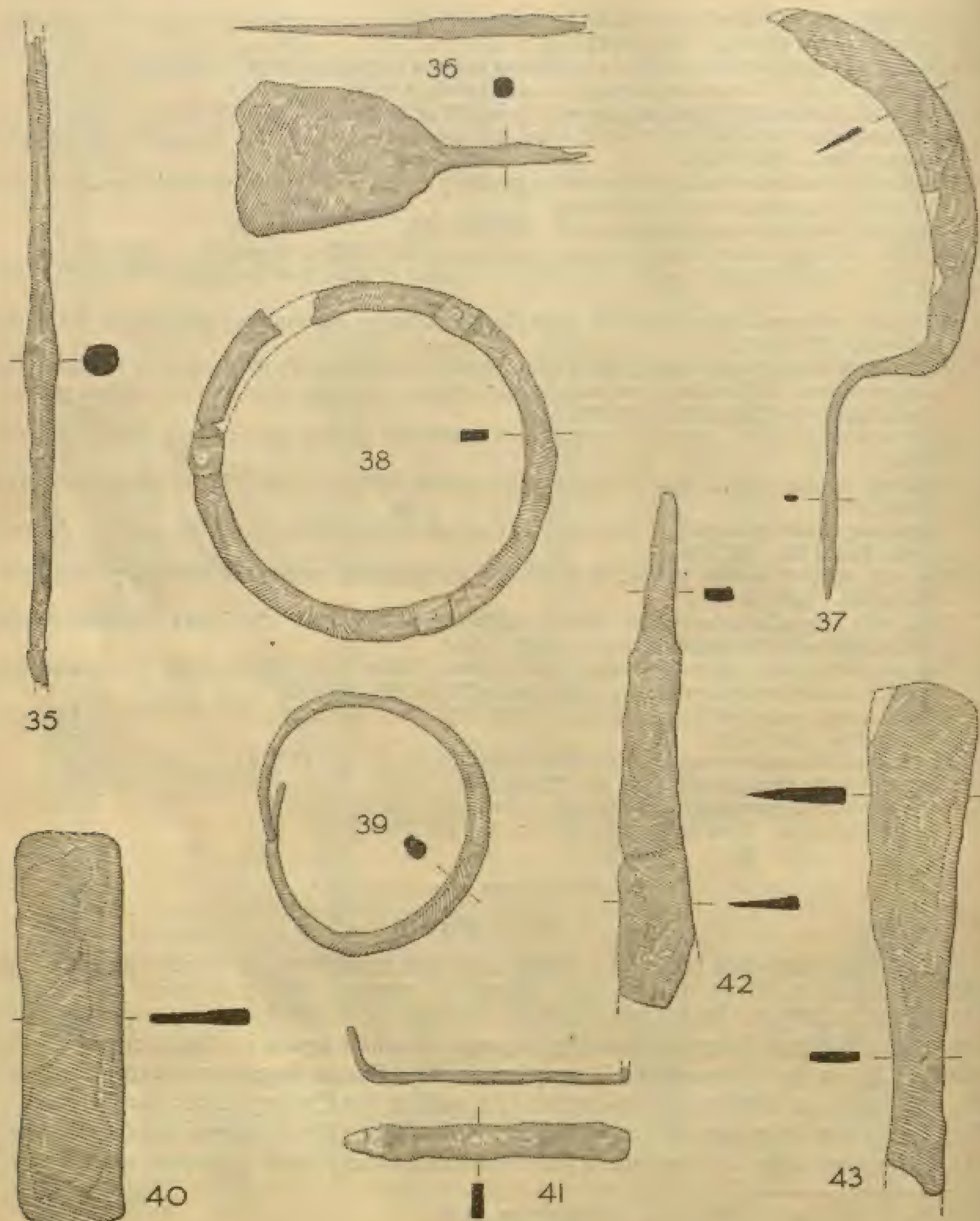
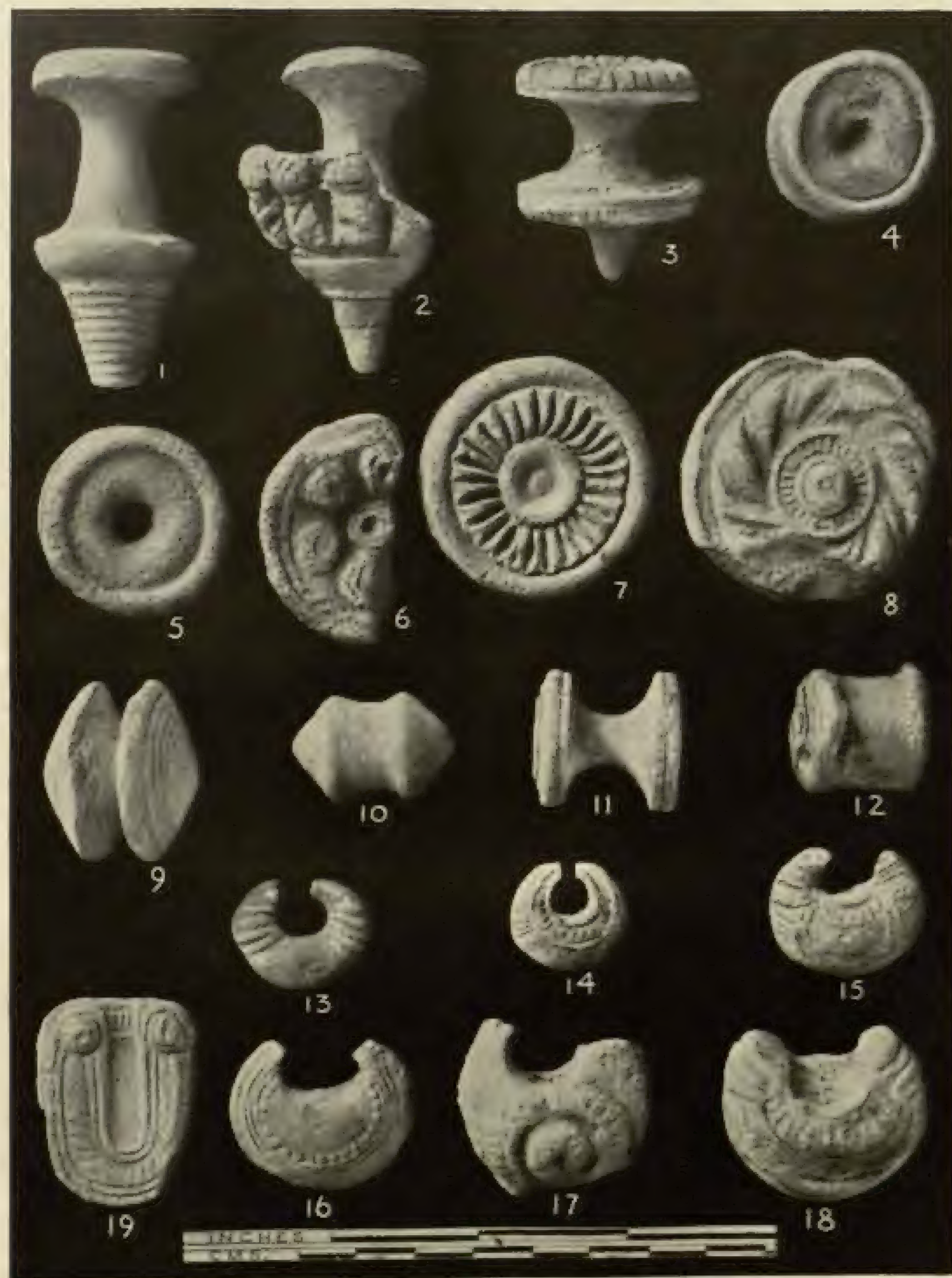


FIG. 11. *Iron implements.* $\frac{1}{2}$



Ear-ornaments



A. *Gold coin of Dharmadamadhara (?).* $\frac{1}{1}$



B. *1-2, lead coins; 3–5, copper coins.* $\frac{1}{1}$



A. *Pottery coin-moulds*



B. *Ivory spacing bead.* $\frac{1}{1}$



A. *Clay* bullae *with animal-figures.* $\frac{1}{1}$



B. *Clay* bullae *with human heads.* $\frac{2}{1}$

and a new combination of obverse symbols, was found in an early level of Period IIB (*c.* A.D. 100); it had already been much worn out by circulation when it was lost.

The copper coins fall into two distinct groups, both typologically and stratigraphically. The first group comprises nine rectangular uninscribed coins, of which three came from the earliest coin-bearing strata of this excavation, viz. the upper layers of Period IIA attributable to *c.* A.D. 50–100. The same number of coins were found in the early level of Period IIB, datable to *c.* A.D. 100–125, while the remaining three were obtained from later deposits. Of a total of nine coins of this group the five legible ones (nos. 3–7 below) bear designs occurring on the copper punch-marked coins from Eran [1] in the Saugor District of the Central Provinces; these appear to have been manufactured either at Eran or under the inspiration of the Eran coinage.

The second group of copper coins, consisting of six thick round pieces, came from later levels and included two Kushan and four Puri-Kushan coins, the latter being found for the first time in a stratified excavation.

The earliest horizon yielding lead coins, five in number, consisted of the upper levels of Period IIB and the lower levels of Period III, attributable to *c.* A.D. 200, while the remaining nine pieces, forming the bulk of the lead finds, came from still higher levels dating from *c.* A.D. 250 to 350. It is significant that lead coins are absent from the earlier levels which produced the majority of the rectangular copper pieces of the first group noted above, and were in circulation at the same time as the Kushan and Puri-Kushan coins of the second group. If the numismatic finds from the present excavation be representative of the whole site, it may be inferred that lead currency was more popular than copper at Śiśupālgarh during *c.* A.D. 200–350. The use of lead as coin-material in Orissa is not surprising in view of the occurrence of lead ore in the neighbouring District of Sambalpur which is the nearest source of this metal, other sources in the proximity being in the Mānbhūm District of Bihar and in Surgujā State and Raipur District of the Central Provinces.

Of the fourteen lead coins from the excavation, which are all rectangular in shape, only two are legible, one (no. 14 below) bearing the well-known lion-type of some of the Āndhra coins,[2] and the other (no. 15 below) showing a head which occurs for the first time on a lead coin. Of the remaining twelve pieces, which resemble the last-mentioned coin in shape, size, thinness of fabric and, presumably, also type, two pieces show part of the so-called Ujjain symbol which is a characteristic of the Āndhra, Eran and Ujjain coinages, while others are too worn out to show any details.

Only legible coins are catalogued below.

(*a*) GOLD COIN [3]

1. (pl. XLVIII A). *Obv.* King standing to l. with peaked helmet and suit of mail, making an offering with r. hand over altar; long spear in l. hand. (Type copied from the coinage of the Kushan king Vāsudeva.)
Brāhmī legend: [*Ma*][*hara**] *ja-ra*[*ja*]*dhasa Dhamadamadhara*[*sa*].
Rev. Head to l. (Type copied from Roman Imperial coins.)
Legend: *.HAIEAI .ZNAI*

Size ·82″; wt. 5·20 gm. Condition—fairly good. The coin was used as a pendant by perforating at its top two holes through which it was attached to an oblong coil of gold wire for suspension. SP II-80, Period III.

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[1] J. Allan, op. cit., pl. XVIII, 7–22.

[2] E. J. Rapson, *Cat. of Coins of Andhra Dynasty* (London, 1908), pl. III, 36–38.

[3] See also note by Professor A. S. Altekar, below, p. 100.

(*b*) SILVER PUNCHMARKED COIN

2. *Obv.* Four symbols, of which one is *svastika* and a second one probably human figure; the other two are indistinct, but one may be a six-armed symbol.
Rev. Caduceus-like symbol.[1]
Rectangular, size ·47″ × ·44″; wt. 1·441 gm. Condition—worn out. SP I-317, early level of Period IIB.

(*c*) RECTANGULAR COPPER COINS

3. (pl. XLVIII B, 3.) *Obv.* Horse to r.[2]; below, wavy design (river-symbol).[3]
Rev. Triangle-headed standard with a taurine within the triangle.[4]
Size ·63″ × ·51″; wt. 1·923 gm. Condition—fair but pitted. SP I-262, early level of Period IIB.
4. (pl. XLVIII B, 4.) Same as no. 3.
Size ·54″ × ·52″; wt. 2·183 gm. Condition—fair. SP I-263, same level as no. 3.
5. Same as no. 3.
Size ·44″ × ·37″; wt. 1·092 gm. Condition—pitted and slightly worn out. SP IVA-4, Period III.
6. *Obv.* Hind part of quadruped (probably horse as on nos. 3–5) standing to r.
Rev. Illegible.
Size of extant fragment ·38″ × ·34″; wt. 0·499 gm. Condition—fragmentary. SP I-304, upper level of Period IIA.
7. *Obv.* Floral design.[5]
Rev. Illegible.
Size ·60″ × ·58″; wt. 2·715 gm. Condition—worn out. SP I-309, upper level of Period IIA.

(*d*) ROUND COPPER COINS

Kanishka

(Same as R. B. Whitehead, *Cat. of Coins in Punjab Mus.*, I (Oxford, 1914), pp. 186ff.)
8. *Obv.* King standing to l. wearing long heavy coat and trousers, offering incense with r. hand and holding long spear in l. hand.
Rev. Standing deity, probably moon-god.
Size ·95″ diam.; wt. 12·726 gm. Condition—worn out. SP IVD-7, late unstratified layer.

Huvishka

(Same as Whitehead, op. cit., pp. 178ff., pl. XVIII, 137.)
9. *Obv.* King r. riding on elephant, holding spear and goad.
Rev. Standing deity, probably sun-god.
Size 1·00″ diam.; wt. 13·048 gm. Condition—fair. SP II-152, upper level of Period IIB.

Puri-Kushan

(Same as Allan, op. cit., p. 207, var. *h*, pl. XXX, 8.)
10–13. (pl. XLVIII B, 5.) *Obv.* Rude figure of king standing l., r. hand out-stretched in the act of offering incense, l. arm raised as if holding sceptre.
Rev. Rude figure of deity standing l., r. arm out-stretched and l. arm bent resting on hip; crescent above on r.
Size from ·85″ to ·91″ diam.; wt. from 7·325 to 9·673 gm. Condition—fair. SP IVP-9a-d, Period III.

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[1] Allan, op. cit., pp. 28–36, pl. V, 1–3, 6-7.
[2] Ibid., pl. XVIII, 7, 11.
[3] Ibid., pl. XVIII, 7, 9, 10, 17, 18.
[4] Ibid., pl. XVIII, 14.
[5] Ibid., pl. XVIII, 12.

(e) Lead coins

14. (pl. XLVIII B, 1.) *Obv.* Lion standing r.[1], an indistinct symbol below lion's head.
Rev. Triangle-headed standard within railing.[2]
Size ·55″×·54″; wt. 3·121 gm. Condition—good. SP III-3, Period III.

15. (pl. XLVIII B, 2.) *Obv.* Head to l., symbols in front of and above head.
Rev. Illegible.
Size ·78″×·66″; wt. 2·024 gm. Condition—fragile and broken. SP I-312, early level of Period III.

16. *Obv.* Orb with a pellet (part of Ujjain symbol).
Rev. Illegible.
Size ·56″×·55″; wt. 1·045 gm. Condition—worn out. SP I-338, middle level of Period III.

17. Same as no. 16.
Size ·78″×·76″; wt. 2·282 gm. Condition—worn out. SP I-243, upper level of Period III.

B. *Coin-moulds* (pl. XLIX A)

The material comprises only two moulds, both of punch-marked coins, which are important inasmuch as moulds of punch-marked coins are extremely rare and are hitherto known only from Mathurā.[3] Made of greyware pottery, both are disc-shaped, one complete and the other fragmentary; each belongs to an independent mould and shows coin-sockets on one face only, the other face being plain. The complete disc (diam. 2·7 inches) shows sockets of eleven coins with designs completely worn out presumably by repeated casting operations, but the irregular shape of the sockets on this as well as on the fragmentary specimen (diam. 3·2 inches) leaves no doubt that they were meant to produce punch-marked coins. The variety of shapes represented on the complete disc is typical of the punch-marked issues and incidentally proves that the different shapes circulated at the same time.

The complete disc has at its rim a V-shaped notch with a straight channel for the inflow of the molten metal. The channel on it is not connected with the coin-sockets by means of feeders, which may be presumed to have existed on the missing couple of the disc. On the rim of this specimen are engraved some key-lines, consisting of two or three straight bars (some of these might be accidental) and an oblique one, which were presumably continued on the missing couple. No luting was detected adhering to the edges of either disc.

The fragmentary disc is not as worn out as the other one but has preserved only one complete socket and two incomplete ones of roughly circular coins. Traces of some designs, too faint to be identified, are visible on the complete socket. This disc shows, besides a central channel, also feeders interconnecting the individual sockets. A notable feature of this disc is its slightly raised margin which is obviously intended to ensure a close coupling with its missing counterpart. An oblique key-line is engraved on its edge and may be presumed to have continued on its couple.

These moulds were found in layers belonging to the late level of Period III, attributable to *c.* A.D. 300. The main interest of these moulds lies in the fact that they were designed to produce in a single operation imitations of coins of a kind which were normally struck with a series of punches. Further, these finds also confirm that punch-marked coins continued in circulation till as late as *c.* A.D. 300.

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[1] Cf. Rapson, op. cit., pl. III, 36–38.
[2] Cf. Allan, op. cit., pl. XVIII, 9.
[3] B. Sahni, *Technique of Casting Coins in Ancient India* (Bombay, 1945), pp. 44–47, pl. VI, 130-131.

A NOTE ON THE KUSHAN GOLD COIN (pl. XLVIII A)

By

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The gold coin found in the excavations at Śiśupālgarh is an important discovery. It was well-known that in Orissa Kushan coins were imitated in later times. But these imitations were all in copper; none of them was in gold or was issued so early as the present piece. On the obverse, the coin imitates the Kushan motif of the king standing and offering oblations on an altar. On the reverse it imitates a Roman head. So far a coin imitating Kushan motif on one side and a Roman head on the other was not known. So this coin is a remarkable addition to our knowledge of ancient Indian numismatics.

Unfortunately the Brāhmī legend on the obverse, which gave the name of the issuer, is incomplete. It probably began at VI. Between IX and XI, one can clearly read *jarajadha*, though the second *ja* is a little doubtful. The letter in question is distinct but does not correctly correspond to any Brāhmī letter. We have to suppose that it is a blunder for *ja*, the right-hand vertical being due to a mistake of the engraver. Near the king's right foot at VII there is a big triangle; it may be a crudely-executed altar or the triangular base of the letter *ma*. It is difficult to choose between these two alternatives, because the legend has not been correctly and carefully engraved. The Kushan emperors used in their inscriptions the title *mahārāja-rājātirāja*, which corresponded to the later common designation *mahārāja-rājādhirāja*. I am inclined to take the triangle at VII as the base of *ma* and would read the legend as *[ma][hara*]ja-ra[ja]dhasa*, which is a blundering and carelessly-engraved abbreviation of *mahārāja-rājādhirājasa*.

The letters that followed must have given the name of the issuer, but they cannot be fully made out. Between the king's head and the spearhead, we have most probably a *dha*, which is followed by a base of the triangle outside the spearhead which can stand for the lower part of either a *va* or *ma*. The next letter is probably a *da* with a rather prominent slanting upper limb; it would have been possible to read it as a *ja*, had not the form of the two other *jas* occurring earlier in the legend been different. The next letter is an unmistakable *ma* followed by a *dha* and *ra*. I would therefore suggest that the name of the issuer was Dhamadamadhara—Sanskrit *Dharma-dama-dhara*—'one who was a supporter both of *dharma* and *dama*'. The letter or letters after *dhara* cannot be made out. I would therefore suggest not without some hesitation that the obverse legend probably was *[ma][hara*]ja-ra[ja]dhasa Dhamadamadhara[sa]*, intended to stand for *mahārāja-rājādhirāja-Dharmadamadharasya*.

King Dhamadamadhara (?) selected for his reverse the motif of a Roman head. I am unable to identify the head, but probably it is not an exact imitation of any particular head. That a king of Orissa should imitate a Roman head may appear rather strange. But we should not forget that it is not only in Madras Presidency but in the United Provinces and Bihar that a number of Roman coins occur. In the Singhbhum District of Bihar a hoard of gold coins including those of Gordian (*d.* A.D. 244) was unearthed. In the United Provinces the coins of Emperor Diocletian (A.D. 283–93), Numerianus (283), Caracalla (*d.* 217) and Carinus (283-4) were found at Allahabad, Chunār, Kanauj, Mathurā and Mirzāpur.[1] Excavations at Rājghāṭ near Banaras have shown that even in holy Banaras people had taken a fancy for Roman motifs and deities like Apollo, Heracles, Nike, etc. and used them on their seals.[2] It is no wonder then that the author of the present coin also chose a Roman head as the reverse-motif.

The date of the coin is clearly later than the time of Vāsudeva I, *c.* A.D. 200, whose coin-type is imitated on the obverse. It must be earlier than the time of Chandragupta I, *c.* A.D. 310, when a new gold currency was introduced in Magadha by the Guptas. The coin will thus have to be placed in the third century. The coins of the Roman emperors found in the United Provinces and Bihar, which supplied the prototype for the reverse of this coin, also belong to this century, as pointed out above.

The *Bṛihatkalpavṛitti* of the Jains, as quoted in the *Abhidhānarājendra*, II (Ratlam, 1910), p. 726, refers to a Muruṇḍa king ruling at Pāṭaliputra, whose widow accepted the Jain gospel. The Purāṇas also vaguely refer to thirteen Muruṇḍa kings ruling in the post-Andhra and pre-Gupta period.[3] It is not unlikely that the Muruṇḍas of the Purāṇas are identical with the Muruṇḍas mentioned in the Jain literature as ruling at Pāṭaliputra.

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[1] *Ancient India*, no. 2 (1946), pp. 116 and 120.

[2] *Journal of the Numismatic Society of India*, III (1941), p. 73.

[3] F. E. Pargiter, *Dynasties of the Kali Age* (Oxford, 1913), p. 46.

The king Dharmadamadhara(?) of our coin, to judge from his name, may well have been a Jain and belonged to the Muruṇḍa family. The family may have ruled over a portion of Bihar and also of Orissa. Or the coins issued by that family may have travelled with the pilgrims to Śiśupālgarh. The Muruṇḍas like the Kushans were foreigners hailing from the north-west, and one can well understand why the king Dharmadamadhara(?) of our coin should have selected the Kushan motif for his obverse. King Dharmadamadhara might have ruled over parts of Bihar and Orissa and felt justified in issuing coins bearing the imperial Kushan title.

(v) CLAY BULLAE

A notable class of finds from Śiśupālgarh is the clay *bullae*. They consist of a disc with a perforated projection at the top, obviously for suspension.[1]

Nine examples were recovered from the excavation.[2] On the basis of the designs on them, they may be divided into two types: A (six examples), with animal figure, notably the humped bull or elephant, and B (three examples), with human heads closely imitating those on Roman coins. The two types are, more or less, coincident, ranging from Periods IIB to III, although one example of the first was found in a late level of Period IIA.

Type A (pl. L A)

Out of a total of six examples of this type five depict the humped bull, standing (in three examples) or seated (in two), while the sixth one has an elephant.

1. Clay *bulla* showing a seated humped bull; from a late level of Period IIA. (SP II-395.)
2. Clay *bulla* showing a standing humped bull; from a pit contemporary with the late levels of Period IIB. (SP II-160.)
3. Fragmentary clay *bulla* showing probably a seated humped bull; unstratified.
4. Clay *bulla* showing a standing elephant; from the same deposit as no. 2.

The two unillustrated specimens are from the same horizon as nos. 2 and 4.

Type B (pl. L B)

Both the illustrated examples (SP II-360 and 370) were recovered from the pit which yielded four specimens of the previous type (nos. 2, 4 and the two unillustrated). A third example of this type (indistinct and not illustrated), however, came from the penultimate level of Period III in the Habitation Area (SP I).

Many other sites in India are known to have yielded clay *bullae* of this type. They have been designated as 'terracotta casts' or 'clay imitations of Roman coins'.[3] Although absolute identity between the heads depicted on them and those on the Roman coins found in India has so far not been established, there is a striking resemblance between the two essentially in respect of features and general treatment of the subject indicating that the portraits on the Roman coins were only imitated and not actually copied. It is also possible that some of them may have been gilded to give them the appearance of gold coins.[4]

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[1] The definition of *bullae* adopted here is that of H. C. Beck, 'Classification and Nomenclature of Beads and Pendants,' *Archaeologia*, LXXXVII (1927), p. 21.

[2] The Śiśupālgarh collection in the Asutosh Museum, Calcutta University, contains two clay *bullae* of the 'human head' type.

[3] Cf. 'Excavations at Chandravalli (Mysore State)', *Supplement to the Annual Report of the Mysore Archaeological Department for the year 1929* (Bangalore, 1931), p. 29, and G. Yazdani, 'Excavations at Koṇḍāpur, an Āndhra town (*cir.* 200 B.C. to 200 A.D.)', *Annals of the Bhandarkar Oriental Research Institute*, XXII (1941), p. 179.

[4] Gold medallions bearing human heads are also known. 'The Buddhist Antiquities of Nagarjunikoṇḍa, Madras Presidency', *Mem. Arch. Surv. Ind.*, no. 54 (Delhi, 1938), pp. 21-22 and pl. XVI, *d*.

All the *bullae* from Śiśupālgarh are cast from single moulds and have a flat back, occasionally with finger-impressions. But elsewhere in India there are examples with figures on both sides, made by cementing together two different casts, back to back. In some cases two pierced holes at the top take the place of the perforated projection for suspension. The subjoined list shows that the clay *bullae* had a fairly wide distribution.

A. ORISSA

1. Śiśupālgarh, Puri District. Present report.

B. UNITED PROVINCES

2. Rājghāṭ near Banaras. Unlike the Śiśupālgarh *bullae*, the Rājghāṭ specimens have two holes at the top for suspension. Krishna Deva, 'Coin Devices on Rājghāṭ Seals', *Journal of the Numismatic Society of India*, III, Part II (Dec. 1941), p. 77 and pl. V, figs. 17–19.
3. Kosam, Allahabad District. Information from Dr. M. G. Dikshit.

C. CENTRAL PROVINCES

4. Kholāpur, Akolā District. 'Has a loop of appliqué work for suspension. On one side of it appears a human bust, closely resembling those in the Mathurā school of sculpture and on the other an imitation of a Roman coin.' Unpublished. Information from Dr. M. G. Dikshit.

D. MADHYA BHĀRAT (MALWA) UNION

5. Garh near Ujjain. Has a human head on the obverse and a lotus on the reverse. *Annual Administration Report of the Archaeological Department, Gwalior State for the year 1938-39* (Gwalior, 1940), p. 18 and pl. XXVIII (*b*).

E. BOMBAY PRESIDENCY

6. Karād, Satara District. Has two holes at the top for suspension. Unpublished. *Explorations at Karad* (Poona, 1949), p. 30 and pl. XIII C-D.
7. Brahmapuri adjoining Kolhapur, in the south of Bombay Presidency. The technique of suspension is the same as on those from Rājghāṭ and Karād; associated with a stratum containing Sātavāhana coins (100 B.C. to A.D. 200). Unpublished. Information from Dr. M. G. Dikshit.

F. HYDERABAD STATE

8. Koṇḍāpur. One of the specimens has two holes for suspension, while the other, in this respect, is identical with the Śiśupālgarh *bullae*. G. Yazdani, 'Excavations at Koṇḍāpur, an Āndhra town (*cir*. 200 B.C. to 200 A.D.),' *Annals of the Bhandarkar Oriental Research Institute*, XXII (1941), pp. 179-80 and pl. XIII (*b*).

G. MYSORE STATE

9. Chandravalli, Chitaldrug District. Has two holes at the top for suspension. 'Excavations at Chandravalli (Mysore State)'. *Supplement to the Annual Report of the Mysore Archaeological Department for the year 1929* (Bangalore, 1931), p. 29.

APPENDIX I

DIMENSIONS OF BRICKS

The accompanying tables give the dimensions in inches of the bricks used at Śiśupālgarh in the various Periods and for different purposes. Since the excavations were essentially vertical and the area explored in the lower levels was very much restricted, it was not possible to expose brick structures, if there were any, of Period I. Of Period IIA too, no brick structures were found in the Habitation Area (SP I). However, the brick revetments of Phase III in the Cutting across the Defences (SP II) and the brick superstructures over the gateway-flanks (SP IV) do belong to the upper levels of Period IIA. The bricks used therein fall into the groups of:

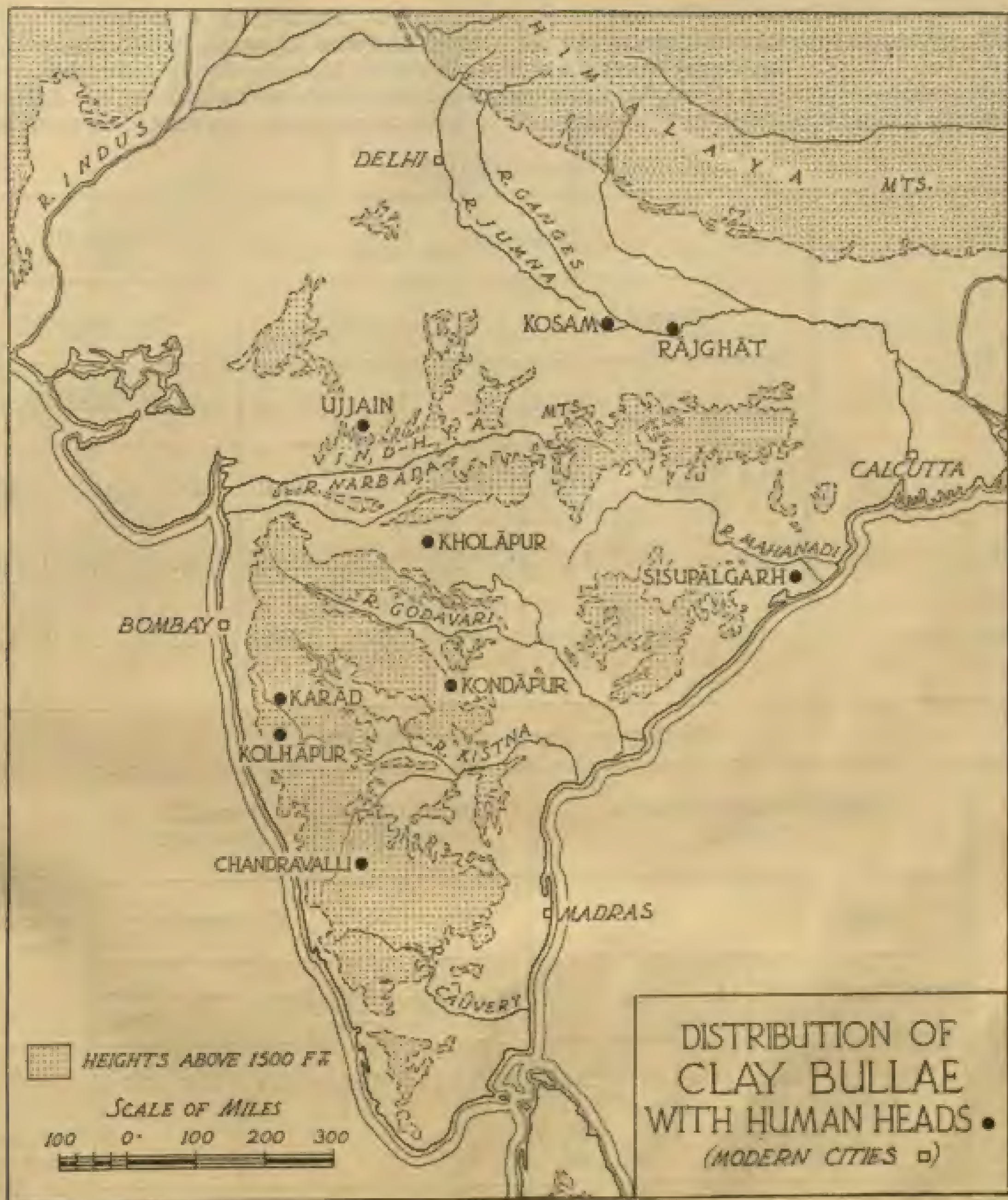


FIG. 12

19·0″ to 19·5″ or 20·5″ to 21·0″ × 9·5″ × 3·5″ to 3·7″; 15·0″ to 16·6″ or 18·2″ to 18·5″ × 11·2″ or 12·0″ to 12·5″ × 3·5″ to 3·7″; 12·5″ to 12·7″ or 13·0″ to 14·5″ × 8·0″ to 9·2″ × 3·5″ to 4·0″.

In the Defences were also used plano-convex bricks either 17·0″ long, 9·0″ broad and 6·5″ high or 14·5″ to 15·5″ long, 9·0″ to 10·0″ broad and 7·0″ high.

In Period IIB the average size of the bricks for house-walls, both at the Habitation Area (SP I) and in the Cutting across the Defences (SP II), was 16·0″ to 16·5″ × 7·5″ to 8·0″ × 3·5″. Bricks of another batch which falls

towards the end of this Period are 13·5" to 13·7"×8·0"×3·5" to 3·7"; similar bricks were also used to block the ancillary passage at the Western Gateway (SP IV). Houses of Period III were built of bricks measuring 12·0"×7·5" to 7·7"×3·5". The scrappy revetments of Phase IV (Period III) in the Cutting across the Defences (SP II) are made mostly of re-used bricks of the earlier Periods and also include smaller bricks of Period III itself.

In general it would appear that the bricks used in the earlier levels were larger than those in the upper levels.

The Habitation Area (SP I)

	Period IIB						Period III		
	Group A			Group B			Only one group		
	Max.	Min.	Normal	Max.	Min.	Normal	Max.	Min.	Normal
Length	17·0	15·5	16·0 to 16·5	14·0	13·0	13·5 to 13·7, 14·0	12·5	11·5	12·0
Breadth	8·0	7·5	8·0	8·5	7·0	7·5 to 7·7, 8·0	8·5	7·0	7·0 to 7·7
Thickness	4·2	3·0	3·5 to 3·7	4·0	3·0	3·5 to 3·7	3·5	2·5	3·0 to 3·5

The Cutting across the Defences (SP II)

	Period IIA, brick revetments, Phase III						Period IIB, House-walls			Period III, House-walls			Period III, Brick revetments, Phase IV
	Group A			Group B			One group only			One group only			
	Max.	Min.	Normal	Max.	Min.	Normal	Max.	Min.	Normal	Max.	Min.	Normal	
Length	17·0	15·0	15·0 to 15·5 16·2 to 16·6	14·4	12·5	12·5 to 12·7 13·0 to 14·0	16·5	15·5	15·2 to 15·5	12·6	12·0	12·3 to 12·5	Contains re-used bricks of Periods IIA and IIB in addition to those of house-walls of Period III.
Breadth	11·0	8·2	11·2	9·5	9·0	9·0 to 9·2	8·0	8·0	8·0	8·0	7·7	8·0	
Thickness	4·5	3·3	3·5 to 3·7	4·3	3·0	3·5 to 3·7 4·0 to 4·3	3·7	3·0	3·3 to 3·5	3·3	2·5	3·3	

The Western Gateway (SP IV)

	Period IIA, brick superstructure over the gateway-flanks									Periods IIB-III, blocking-wall of the ancillary passage		
	Group A			Group B			Group C					
	Max.	Min.	Normal	Max.	Min.	Normal	Max.	Min.	Normal	Max.	Min.	Normal
Length ..	21·0	19·0	19·0 to 19·5 20·5 to 21·0	18·5	15·0	15·0 to 16·0 17·5 18·2 to 18·5	14·5	13·0	13·0 14·0 to 14·5	14·0	13·0	13·5 to 13·7
Breadth ..	10·0	9·0	9·5	12·5	9·0	12·0 to 12·5	10·5	8·0	8·0 to 9·0	9·2	7·0	7·5 to 8·0
Thickness ..	4·5	3·0	3·5 to 3·7	4·0	3·0	3·5 to 3·7	4·0	2·7	3·5 to 4·0	3·5	2·5	3·0 to 3·2

TECHNICAL SECTION

5. VEGETATION ON MONUMENTS

By K. R. Srinivasan

In this article the author deals with an outstanding problem of the conservation of monuments in a tropical country like India, viz. the growth of vegetation, which has to no inconsiderable degree led to the destruction of many monuments or, in the case of those destroyed or disfigured by other agencies, now forbids a proper preservation of whatever is left. Some of the methods recommended by him have already been employed in India; others will be experimented with under suitable conditions.

I. Nature and problems

ONE of the major problems that confronts the conservator in the course of his work on the conservation and maintenance of archaeological monuments is vegetation and the problems of its effective removal without injury either to the form or fabric of the monument over which it is found. In a country like India where diverse kinds of climatic and ecological conditions obtain, the flora found on the monuments is varied and includes all the visible classes of the plant kingdom—algae, lichens, liverworts, mosses, ferns and flowering plants.

The algae which are usually the sub-aerial forms are often met with on monuments in the heavy monsoon districts and the humid altitudes. Though the individual members are microscopic, they are visible to the naked eye when in clusters. They are mostly the green algae (chlorophyceae) and the blue green algae (cyanophyceae). Except when in profusion, in which case they discolour and obscure the area, they are not a very serious menace and can be removed comparatively easily.

Lichens on monuments (pls. LI and LII A) are usually the crustaceous forms—appearing as pale, bluish green, circular, spreading patches with dark round dots (spores) here and there—found closely adhering to the surface of the stone or sculpture. These are universal in distribution and can thrive well even in dry and exposed situations; when in isolated patches these disfigure the monument by their contrastive colours, and when in large numbers obscure the finer details of the sculpture or carving.

Liverworts and mosses are gregarious soft-bodied green plants (non-vascular) thriving in humid and cooler localities. They can cover by their luxuriance entire areas of space sending in their numerous rhizoids into the substratum. Moss can dry up *in situ* and revive later with moisture and is therefore absorbent. By its absorptive power it will add to the desiccating effect of the dry weather and by retaining moisture keep the substratum oversoaked during wet weather or humid nights. Thus it can set up not only constant variations in the humidity, but also movements of water through the pores of the substratum, thereby enlarging them and affecting the fabric. By the decay of their lower and older vegetative parts, close to the substratum, they create a lot of humus, and the acids produced can thus penetrate the substratum. Thus by the spread of their numerous tiny rootlets which permeate every crevice and joint and by their behaviour to moisture and production of humus acid, the mosses are detrimental to monuments in the long run.

The ferns, also lovers of shade, moisture and cooler conditions, are larger vascular plants with woody shoots and perennial rhizomes or underground stems, which have

endless potentialities of hibernation during dry or unfavourable seasons and prolific budding and growth on return of favourable conditions. The expanding and branching rhizome, with its numerous rootlets at every node, by its activity during growth soon permeates, if possible, the core of the structure, loosening up the material on the way. Besides, by the shrubby nature of their leafy fronds they externally obscure a full view of the monument.

Among the flowering plants the herbs, e.g. grass and other species of compositae (thistle family), to mention only the most common and ubiquitous, have either long tap-roots with ramifying rootlets or clusters of tendril-like fibrous roots, or perennating rhizomes or stolons. These produce a similar effect as detailed above. In the cases of woody shrubs and trees it is the penetrating, enlarging and ramifying stouter root-system that disorganizes the structure of a monument (pl. LIII A), and either distorts its shape or dislodges its members, soon converting it into a heap of ruins. Among the climbers, the tendril and root-climbers like the vines are the most objectionable. Not only do climbers cover up the entire view, they stifle the structure or support, and soon by their increasing weight pull down parts of it. The stout woody climbers or *lianae* (pl. LII B) are the worst. The root-climbers, by producing roots at every node of their stem, cling to the walls and sides of the structure and their penetrating clinging roots add to the damage.

In all kinds of plants while the green shoots grow towards light (positive heliotropism) and away from the force of gravity (negative geotropism), the roots are the opposite, i.e. negatively heliotropic, and positively geotropic and in addition hydrotropic, i.e. grow towards moisture. This is as it should be in so far as the well-being of the plant is concerned. This explains why the roots of the plants on the monuments should grow into the structure. When once established on the surface the darker core of the structure, which retains more moisture than the surface as it is less exposed and sufficiently insulated from the desiccating effects of sun and wind, offers the right conditions for the root to grow in. The geotropic effect makes the root grow deeper downwards, and the ultimate effect is that in the case of larger shrubs, trees and epiphytes the enlarging root-system by its growth in thickness and length sets up pressures inside, pushing apart the surface-layers, very often making them bulge out or dislodging them; and this effect of disintegration starts from the top and proceeds towards the base. In the case of the smaller plants their roots when penetrating the crevices below the plaster set up enough forces to dislodge the plaster.

To sum up, the effects of growth of various kinds of plants on a monument are of two kinds, viz.:

1. *Mechanico-physical*, resulting through the blasting effects of the expansion of the roots in length and thickness, disorganizing the substance of the core, dislodgement of the facing stones or plaster, setting up of cracks and enlargement of existing crevices and pores and consequent access of moisture to the core through these openings and the voids left by the natural death and drying up of older roots. These cavities which collect moisture may be enlarged by frost in regions with sharply contrasting climatic conditions, the process of freezing and thawing setting up differential pressures in addition. In monsoon-regions, the water soaks in, disintegrating the binding material and washing it away resulting in total damage to the structure. If salts are present the same effect is brought about by their solution and crystallization.

2. *Chemico-physiological*, resulting in the decomposition of the material and absorption as food-salts of the soluble ingredients and production of harmful chemicals as a result of the growth and activity of the plant, the formation of humus from the decomposition of the decayed old parts of the plant and the production of humus acids. These act as solvents, reacting chemically on the substance of the structure. The magnitude of these effects resulting from the presence of the different groups of plants mentioned above is one of varying degree, the lower groups when in profusion being as much capable of producing

damage as a few isolated herbs, shrubs or trees. A thick and extensive felt of moss or lichen (including algae) over the lime-plaster of a terrace, dome or spire can by its continued activity render the plaster porous causing leaks and destroy its cohesive properties causing cracks. While both stone and brick structures are vulnerable to the effects of the first factor—viz. mechanical, it is mostly the brick structures with mortar-binding or structures the stones of which contain vulnerable compounds—such as limestone or marble (Calcium Carbonate), granites with felspar and mica, sandstones and bricks or stones containing marl, that are more affected by the second or biotic factor. Stones with compact texture or quartzitic and flinty stones are less easily affected. These therefore add to the weathering effect of the climate and make the stones lose their cementing material and become gritty and friable by slow degrees. More than the stones, which by their rough surface may form a harbouring place for algae, lichen and moss, it is the open joints, or the mortar therein, of the brick or stone that attract and harbour epiphytic plants of all kinds including the higher groups. Either the accumulated dust and grit and the free access to the solid core in the open joints or the binding mortar affords space and material for vegetation. In cyclopean masonry the joints, usually open, are long and wide and can harbour large shrubs and trees, while brickwork can expose more of such vulnerable space since the joints are nearer.

How these plants reach such situations above the ground is a question to be briefly answered. While the lower non-flowering plants (cryptogams), e.g. algae, lichen, moss and fern, can spread and reproduce by spores, the flowering plants (phanerogams), herbs, shrubs and trees, reproduce through seed. Many of the spores and seeds are wind-borne and they are carried there by the prevailing winds. Some are borne on the feet of walking and wading birds, which perch on the monuments and animals which walk over them, while some are undigested seeds cast in the droppings of frugivorous birds and bats, e.g. *Pīpal, Bo* (Ficus), *Nīm* (Margosa), *Morinda.* The presence of moisture is enough for their germination, and when once the seedling can strike root on the substrate, it absorbs its sustenance from the material of the substrate, if it is sufficiently vulnerable, and eventually it grows into a young plant. Very often the roots grow along the side or down inside the core and reach the ground, holding much of the structure in its octopus-like grip (pls. LIII B and LIV).

II. Methods of removal and control

Short of complete eradication or outright killing, no halfway measure will be effective. Such methods are considered below.

A. *Cutting*

One of the methods that would strike anybody as the most obvious would be the cutting down of the offending vegetation. This cutting is necessary to clear the monument and expose it to full view. This may be followed by raking out any tendrils or roots that may be easily accessible to the knife or other suitable tool between the joints or inside the crevices. The cutting out of large trees from a monument is an operation that demands special care. As a rule large trees should be removed in sections in order to prevent injury being done to the brickwork or masonry. The physiological factors involved in this process of elimination are overlooked. The frequent cutting away of the exposed shoot or injury of the exposed portions of the root, viz. the older parts at the base of the stump, while the major part of the younger roots, or the rhizomes with their actively growing tips (growth in plants, especially the roots, is apical) are intact inside, only stimulates them to greater activity. The injury itself is a stimulus; as a living organism the plant-body responds to it; and the activity of the dormant, latent and adventitious buds is increased and they grow out into fresh shoots or saplings or suckers putting forth more roots. This simply very



Rohtas fort, District Shāhābād, Bihar: large patch of lichen on the right of the balcony and sporadic patches on the left



A. *Muktešvara temple, Bhuvanesvar, District Puri, Orissa: lichen covering almost the whole of the* vimāna *and parts of the* jagmohan *in sporadic patches*



B. *Fort-gate, Bhāṇḍak, District Chāndā, C.P.: heavy climbers dislodging masonry*



A. *Ruined temple near Koṭitīrtha, Bhuvanesvar, District Puri, Orissa: woody shrub on* vimāna *bursting out the structure*



B. *Ruined brick tomb on Rājmahal Road, Hadaf, Santal Parganas, Bihar: ficus established on top and clasping the structure with aerial roots*



Old palace, Sassaram, District Shāhābād, Bihar: ficus on structure with roots penetrating and striking ground

often acts as a process of pruning, in this case root-pruning, or budding, an operation well-known to every gardener or horticulturist who prunes his trees or trims his hedges to invigorate growth and raise the yield, or to make it more bushy and woody. Plants have a great capacity for healing wounds and repairing damage to their parts. Thus periodical clearance of the surface outgrowth, though it will keep it trim for the season, will not only make the plants come out in greater abundance during the next season but also increase their toughness and the harmful activity of the root-system. On mounds, stone-circles, cairns and dolmens the digging up of the root-system or the total uprooting of the plant may be found very easy, but such an operation will result in disturbing the entire stratification, at least to the depth of penetration of the roots, and dislodgement of the buried antiquities from their normal position. If conservation is for purposes of a future excavation where stratification is the main basis of evidence, this method of eradication will defeat the purpose.

B. *Exposure and drying up*

In cases where the structure is of large blocks of stone already displaced or dislodged by the roots in the core, the stones may be taken apart in order to get at the roots and pull them out or thoroughly cut them up and leave them to dry. After this the stones may be re-set in position and the voids sealed with suitable mortar. But this process can apply only in cases where restoration or repair is to be done and may not be possible in those cases where the extant fabric is on no account to be disturbed.

C. *Firing*

Another method which will seem to be very obvious is to set the dried-up vegetation and exposed roots on fire. This will naturally char the surface and mar the effect making the remedy worse than the disease. The burning out of tufts of grass or bushes of bracken on top of a wall, terrace or *gopuram* may often be a tempting proposition, but in addition to the blackening effect the heat itself may be injurious to the fabric. Sometimes in order to destroy the fibrous roots inside the joints between stones and bricks or inside cracks and crevices a jet of smokeless flame, from a blow-lamp (Etna burner), may be played swiftly into the crevice protecting the edges on either side of the opening by placing two tiles or slabs of stones or brick. But this may not be quite effective in cases where the roots are too deep-seated, beyond the reach of the flame.

D. *Steaming*

Another method, also employed in agriculture for the control of weeds, is the use of super-heated steam, the injection of which through a bore by means of a nozzle, so as to reach and permeate the core containing the roots, may kill and cook the tissues and expose them to the activity of saprophytic bacteria and fungi. This has to be done by closing all other cracks in the area by lumps of clay, leaving one opening for letting in steam and at least one other for its escape, as is done in pressure-grouting. Under conditions where no injury to the material is anticipated, this may be effective and deserves a trial.

E. *Chemical methods*

A very practical method in such cases would therefore appear to be a process which would kill the roots *in situ* and prevent their further revival. This would involve the use of a suitable chemical and a technique which would ensure the penetration of the chemical into the tissues of the hidden root-system and effectively destroy it. Though a number of such chemicals which are used as killing agents in the laboratory (formalin, etc.) and in

large-scale phytocidal operations as weed-killers and parasite-killers in agriculture and forestry can be thought of, the choice of such for the archaeological conservator is rather limited. The chemical chosen has to be effective, comparatively cheap, easy to employ on a large scale by unskilled hands, free from danger either to the user or to the visitor and grazing cattle; for monuments are situated in inhabited localities or are intended to be visited by people. Most important of all, the chemical must not have harmful, corrosive, or destructive effects on the material of the monument, nor leave any permanent disfiguring stain (as will be left by blue vitriol, silver nitrate after exposure, coal-tar or oily preparations, etc.) and which may be more difficult to remove than the vegetation itself. Corrosive acids and chemicals which would react on stone, brick, mortar, wood and metal or irritating or volatile poisons have to be avoided, the last particularly when the work is to be done by unskilled labour, sometimes without supervision, as also such chemicals that cannot be easily washed off from the surface after the effective sealing of the openings. A choice of chemicals and methods of employment will be briefly described below.

(i) *Blue vitriol paste.*—Powdered copper sulphate mixed with fine fuller's earth and (or) very finely pulverized pumice stone and made into a paste with water and some glycerine may be applied over patches of lichen or alga and left for a day or two. The glycerine will keep the treated surface wet. Subsequent light scrubbing with brush and washing with water will remove the encrustation of lichen or alga, and, sometimes, also a close felt of small moss. This can be recommended only in the case of material which is compact like stone and is non-porous, as otherwise in a porous material the blue vitriol will soak in and cannot be removed completely—thereby leaving a bluish stain. Stone sculptures and the like can be thus treated. If necessary, a final brushing of 4 p.c. formalin in water will kill away any remaining organic matter. (*N.B.*—Formalin is volatile, and its vapours will irritate the eyes, skin and mucous membranes.)

(ii) *Ammonia and Zinc Silicofluoride.*—In the case of porous material such as lime-plaster the lichen, algae, etc., may first be softened by coating dilute Ammonia (also volatile and irritating when strong) and then scrubbed carefully. Then a 2 p.c. solution of Zinc Silicofluoride may be applied when dry.

(iii) '*Atlas*' *Tree-killer*, a patented preparation, is often advocated as suitable in the case of large vegetation. This has been used with varying degrees of success in agriculture and in conservation. This has to be applied not only to the cut-ends of the stumps but also on the tissue exposed by ringing off of the bark close to the surface of the ground.[1] This preparation is highly poisonous and may be suitable for trees on tops of walls, spires, etc., but when used on vegetation over such monuments as mounds, stone-circles, etc., men and grazing cattle have to be kept off till the dead vegetation is removed. While the concentrated material will be required for killing trees and shrubs, dilute solutions may be employed on softer plants such as moss and liverwort. In experiments with various phytocides for the destruction of 'spiked'[2] sandal trees it was found that while this preparation was more effective than other (non-arsenical) poisons, its action was not very rapid and that the dilute solution was less effective than the concentrated one. Its action was also found to be less rapid during the monsoon than at other times, as also on trees in the more advanced stages of the disease.[3]

(iv) *Arsenites and Arsenates of Potassium and Sodium* in solutions of suitable concentration are also good phytocides. They are highly poisonous. In experiments on

[1] *Bulletin 9 of the Government Mycologist*, Madras Agricultural Department.

[2] 'Spike' is a virus disease affecting the sandalwood tree and many other plants.

[3] Varadaraja Iyengar and Rangaswami, 'Studies in Control of Spike-disease', part II, *Indian Forester*, LXI (1935), pp. 106–110.

'spiked' sandal using 2½ lbs. per gallon strength it was found that Potassium arsenate was more effective.[1] Better than spraying is the method of frill-girdling and injections of the poison as adopted by Napper who used Sodium arsenite for the destruction of old stumps in rubber-plantations in order to prevent their serving as hosts to parasitic fungi which would infect the untapped trees.[2]

(v) *Other Arsenical preparations.*—A solution containing oxide of Arsenic in Caustic Soda (NaOH) may be used. The following preparations were tried on 'spiked' sandal:

2 lbs. of As_2O_3+1 lb. of NaOH in a gallon.
4 lbs. of As_2O_3+1 lb. of NaOH in a gallon.
5 lbs. of As_2O_3+1 lb. of NaOH in a gallon.
Arsenic chloride in dilute Hydrochloric acid (HCl).
Saturated solution of Arsenic acid.

Of these, the fourth (acid solution of Arsenic Chloride) and the solution containing a high percentage of Arsenic in alkali were the most effective. Of the two, the latter, viz. 5 lbs. As_2O_3 + 1 lb. NaOH in 1 gallon of water, was very widely used since it had some advantages; a single treatment was found sufficient, and its potency was not appreciably affected even if there was a shower immediately after application.[3] While this solution may suit the conservator's needs, the last two, which are acidic solutions, are not to be advocated.

(vi) *'Atlas' substitute.*—A substitute for 'Atlas' Tree-killer (a patented preparation not easily available in bulk in the post-war market) has been evolved by the same workers. It can be made on smaller scale for immediate use, or can be prepared in bulk and stored.

The formula for small-scale preparation will be as follows:—

	Double strength	*1½ strength*	*Single strength*
As_2O_3	65·64 grams.	48·0 grams.	30·0 grams.
NaOH	20·0 ,,	20·0 ,,	20·0 ,,
Casein	2·0 ,,	2·0 ,,	2·0 ,,
Phenol (Carbolic Acid) ..	2·0 ,,	2·0 ,,	2·0 ,,
Water	100 c.c.	100 c.c.	100 c.c.
Specific gravity	1·5749	1·4773	1·3136

In preparing the above 20 gr. of NaOH are dissolved in 60 c.c. of water and boiled when the casein powder is added and stirred. The solution is removed from the flame and powdered As_2O_3 (taken according to strength indicated above) is added in small quantities and stirred. (This must not be done while the solution is on the flame.) The mixture is again boiled for five minutes till the solution becomes clear without scum-formation as far as possible (in case of scum-formation it may be filtered through muslin). When cool 2 gms. of phenol (Carbolic Acid) is added, then water to make up to 100 c.c. and the preparation is finally coloured by a drop of phenolpthalene, bottled and labelled as POISON.

The single-strength mixture was found to be as effective as the 1½ and double strength on 'spiked' sandal.

For a large-scale preparation and bulk-storage the following will be the quantities. As_2O_3, 3 lbs.; NaOH, 2 lbs.; Casein, 3 ozs.; Phenol, 3 ozs.; and water, 1 gallon.

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[1] Ibid.

[2] *Report Rubber Research Institute, Malaya* (1939), pp. 157–71.

[3] Varadaraja Iyengar and Rangaswami, op. cit.

(vii) '*Gas oil*'.—Another method employed by Smith[1] for destruction of banana stumps *in situ* may be suitably adapted for our purposes of killing vegetation on open sites, such as mounds, stone-circles, cairns, dolmens, cists, barrows, etc. He tried many chemicals, of which heavy gas oil (the fraction from the 'topping' process of refining) proved most satisfactory in all respects, including that of cost. Only 2-3 pints were required per stump; after cleaning away the surface-trash the oil was applied around the stump rather than on the cut surface. Oil thus applied penetrated into the underground buds and killed the 'eyes' from which new growth would otherwise start; large applications of oil to the cut surface was found unnecessary. What applies to the banana will, it is expected, equally apply to all herbaceous flora with underground stems—stolons, rhizomes, bulbs, etc., and roots which when injured send out suckers or bases of stumps which put forth saplings.

(viii) *Methoxone*.—This wartime discovery promises to come to the rescue of the conservator in the post-war era, as it has to the agriculturist in solving his problem of the destruction of unwanted and harmful weeds. The method is based on the discovery of Hamner Tukey (U.S.A.) in 1944 of the properties of some well-known 'plant-hormones' or growth promoting compounds which, while beneficial in invigorating plant-growth when administered in optimum doses, could easily lead the plant to its own destruction by rapid overgrowth when the doses exceed the tolerance-level. Methoxone, a plant-hormone, was thus found to kill outright certain weeds in this manner without killing the wheat or barley crop amidst which they grow, showing that the lethal strength in the case of certain plants is not harmful in the case of others. In certain concentration it retards or prevents the germination of certain seeds of the sensitive species and spraying of one or two lbs. per acre was found to effectively kill most kinds of weeds. The credit of first experimenting successfully with this chemical in India goes to Mr. K. M Thomas (Government Mycologist, Coimbatore), and his results are very instructive. As a result of varied experiments in green-house and field he succeeded in showing that a gallon of methoxone spray (concentration 1 in 100) could effectively kill dense growths of water-hyacinth (*Eichhornia* sp.) over an area of 100–150 square feet. Water-hyacinth is an introduced water-weed, which has run wild everywhere in India and its successful eradication was a problem which so long baffled the botanist, chemist, agriculturist and the irrigation-engineer. There seem to be great possibilities with this chemical, which when used in larger quantities and concentrations may be useful in destroying much of our unwanted vegetation. The chemical is available both in powder- and liquid-forms and has besides the advantage of being non-corrosive, non-poisonous and non-inflammable.

(ix) '2, 4 D' (Dichloro-phen oxy acetic acid) belongs to the same category of plant-hormones used as a phytocide by the U.S. Department of Agriculture. Full experimental data regarding this war-time chemical are now available.

III. General conclusions

What seems to be indicated is a more scientific approach to the problem which would include a classification of the nature and type of vegetation involved, the choice of the phytocide suited to each, the method of its employment, both of which are to be determined in relation to the fabric of the monument which acts as the substrate and its location and access to visitors and animals. The cost involved and the ease with which the respective operation is performed are also very important considerations, since the funds at the

[1] F. E. V. Smith, 'Panama disease—the use of chemicals for killing bananas in the treatment of Panama disease', *Tropical Agriculture* (Trinidad), IX, pp. 83–86.

disposal of the conservator are limited, and the clearance of vegetation forms only a part of his varied work. Another factor to be counted is that the conservator is not himself always a botanist or chemist and will have on most occasions to depend on his own resources and get the work done by unskilled labour. It will be therefore essential for the technicians to conduct a series of experiments themselves, or get them done by the conservator under controlled conditions and watch the results before recommending remedies in specific cases.

Having determined the method for employment, the first step will be to clear away as much of the vegetation as possible by cutting and raking out. This will reduce the amount of chemical to be employed, facilitate the operation and expose as much of the wounded surface to the chemical as possible. When vegetation such as algae, lichen or moss has been killed *in situ* and the dead remains allowed to dry up, it can be removed only by mechanical means, such as scrubbing with a stiff fibre brush. The surface will have to be wetted by a spray from a bucket pump (or stirrup pump) and then scrubbed and washed off by a forceful jet from the stirrup pump. While scrubbing special care must be taken in cases of old plaster and brick- and mortar-surfaces, for too much of it will injure the surface. When the woody plants have been cut away and their roots killed, the stumps and other remains must be carefully removed as far as possible, bit by bit, and the voids left and other crevices, cracks and joints sealed by suitably coloured mortar.

More than eradication, the preventive measures are important. The surface has always to be brushed or swept clean, for accumulation of dust and dirt soon forms a substrate for spores and seeds to settle and germinate. Measures to prevent dampness should be taken and the monument kept as dry as possible by draining water away from it. The nature and directions of the prevailing winds are to be noted, for the wind carries not only spores and seeds but also moisture. In monsoon-areas, the side exposed to the monsoon-wind harbours more vegetation than the other sides. Where the wind is dry or laden with salt from the sea the side exposed to it shows less vegetation than the other sheltered sides. All joints must be frequently cleaned with brush and young seedlings promptly uprooted as soon as they appear. This will save a lot of heavier work which will result if they are left alone. Every crevice and joint must be closed. In stone structures, where the stones are fitted without the use of binding-mortar, such crevices are common and they are often widened by the crumbling or weathering of the edges of the stones. Such openings must be carefully filled with inert material. When tufts of grass or similar herbaceous vegetation have been destroyed on the top of a flat terrace or spire, the remains are to be thoroughly cleared and pure lime (CaO) dusted or spread, after the sealing of the cracks. Open terraces must always be kept well-swept.

The conservator must possess the necessary tools, implements and chemicals in his kit. In addition to the minor tools for cutting and raking—e.g. a hand-axe, small pick, small crowbar, good gardener's knife, sickle, trowel, rakes and pins and brushes and brooms of sorts, he must be equipped with a metallic syringe, a stirrup-pump with a length of about 30 feet of hose having combined jet and spray ends, bucket, blow-lamp and ladder. While using poisonous chemicals all care and precaution must be taken, both in its storage and during its application and the labourers employed sufficiently warned. It will also be safe to keep away visitors till the completion of the work.

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